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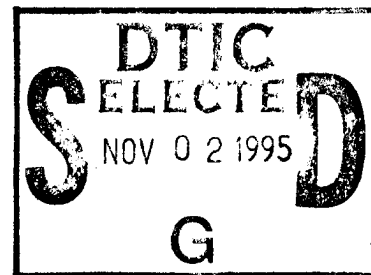


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# NAVAL POSTGRADUATE SCHOOL MONTEREY, CALIFORNIA



## THESIS

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**AN ANALYSIS OF THE IMPACT OF OFFSET  
REQUIREMENTS ON THE U.S. AND DEFENSE INDUSTRY**

by

Michael K. Woodward

March, 1995

Principal Advisor:  
Associate Advisor:

Thomas Hoivik  
Richard Doyle

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AN ANALYSIS OF THE IMPACT OF OFFSET REQUIREMENTS ON THE U.S. AND  
DEFENSE INDUSTRY

by

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Captain, United States Marine Corps  
B.A., Chaminade University of Honolulu, 1991

Submitted in partial fulfillment  
of the requirements for the degree of

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from the

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## **ABSTRACT**

The purpose of this thesis is to determine if offset agreements, as a condition of sale of military articles, have an adverse effect on the U.S. national security and the defense industrial base. The effects of offset agreements are measured from the context of their implications for defense preparedness, competitiveness of U.S. defense companies in the world's arms market, levels of foreign dependence in U.S. weapon systems and the transfer of technology to foreign countries and competitors. Additionally, offset agreements are analyzed as a contributory factor to the globalization of the arms industry and its consequences on the existing defense industrial base evaluated. It is concluded that the future arms market will consist of increased transnational cooperation, requiring the U.S. defense industry to establish strong relationships with foreign counterparts to retain access to their markets. Additionally, the increase in arms producers in the world will challenge arms control efforts and require continued technological innovation to prevent the U.S. lead from eroding further.

## TABLE OF CONTENTS

I. INTRODUCTION .....	1
A. PURPOSE .....	1
B. BACKGROUND .....	1
C. THESIS OBJECTIVES .....	2
D. RESEARCH QUESTIONS .....	3
1. Primary .....	3
2. Subsidiary .....	3
E. METHODOLOGY .....	3
F. SCOPE OF THESIS .....	4
G. ORGANIZATION .....	5
II. SECURITY ASSISTANCE .....	7
A. SECURITY ASSISTANCE AND FOREIGN POLICY .....	7
B. U.S. SECURITY ASSISTANCE HISTORY .....	8
C. EARLY SECURITY ASSISTANCE POLICY .....	10
D. PRESENT SECURITY ASSISTANCE POLICY .....	13
E. U.S. SECURITY ASSISTANCE PROGRAMS .....	15
1. Foreign Military Sales (FMS) .....	15
2. Foreign Military Financing (FMF) Program .....	16
3. Commercial Sales Licensed under the AECA .....	16
F. U.S. GOVERNMENT ORGANIZATION FOR SECURITY ASSISTANCE .....	16
1. Authorizations: .....	17
2. Appropriations .....	17
G. DOD ORGANIZATION FOR SECURITY ASSISTANCE .....	17
H. FOREIGN MILITARY SALES PROCESS .....	21

I. SUMMARY .....	22
III. OFFSETS, POLITICAL AND ECONOMIC IMPLICATIONS .....	25
A. INTRODUCTION .....	25
B. OFFSETS .....	26
C. CONGRESSIONAL CONCERNS - IMPACT OF OFFSETS .....	28
D. DEFENSE INDUSTRY REACTION .....	32
E. EXECUTIVE BRANCH POLICIES .....	35
IV. OFFSETS IN MILITARY EXPORTS, THE OMB STUDY .....	39
A. BACKGROUND .....	39
B. GENERAL SURVEY RESULTS .....	41
C. DEFENSE PREPAREDNESS AND INDUSTRIAL COMPETITIVENESS .....	44
D. OFFSET IMPACT ON EMPLOYMENT .....	47
E. OFFSET IMPACT ON TRADE .....	50
F. SUMMARY .....	55
V. OFFSET AGREEMENTS AND THE GLOBALIZATION OF DEFENSE PRODUCTION .....	57
A. GENERAL .....	57
B. OFFSETS AND GLOBALIZATION .....	58
1. Patriot Missile System .....	63
2. AWACS .....	65
C. SIGNIFICANCE OF GLOBALIZATION .....	67
D. CONSEQUENCES OF OFFSETS IN GLOBALIZATION .....	71
E. SUMMARY .....	74



VI. CONCLUSIONS AND RECOMMENDATIONS .....	75
A. DEFENSE PREPAREDNESS .....	76
B. INDUSTRIAL COMPETITIVENESS .....	79
C. NATIONAL SECURITY .....	81
D. RECOMMENDATIONS .....	83
1. Overview of Current Initiatives .....	83
2. Military and Commercial Research and Development .....	85
3. Foreign Sourcing .....	85
4. Defense Industrial Base .....	86
5. Globalization .....	87
6. Export Controls and Proliferation .....	87
E. FUTURE RESEARCH AREAS .....	90
LIST OF REFERENCES .....	91
INITIAL DISTRIBUTION LIST .....	94

## **I. INTRODUCTION**

### **A. PURPOSE**

The purpose of this thesis is to determine if offset agreements, as a condition of sale of military articles, have an adverse effect on the U.S. national security and the defense industrial base. The effects of offset agreements will be measured from the context of their implications for defense preparedness, competitiveness of U.S. defense companies in the world's arms market, levels of foreign dependence in U.S. weapon systems and the transfer of technology to foreign countries and competitors. Additionally, offset agreements will be evaluated as a contributory factor to the globalization of the arms industry and its consequences evaluated.

### **B. BACKGROUND**

Following the end of World War II, the United States of America emerged as the world leader in providing military arms and material to allied and other friendly countries. The transfer of military arms has been traditionally accomplished through a buyer-seller relationship; however, in today's environment of exporting military arms, such is not the case.

Today's military arms market can be best described as one that transcends monetary issues and focuses on other benefits to the recipient country in the form of offsets. Offsets, whether direct or indirect, are terms of a sale, whereby the purchasing country receives additional consideration beyond the military equipment itself. This additional consideration can range from requiring an aerospace firm to sell Hungarian hams in the U.S. to a requirement that a certain percentage of contracted-related work be performed in the recipient country by its citizens. While the former can be amusing, the latter could have some rather dire consequences for the United States' ability to maintain the "technological edge" and U.S. defense industries' ability to remain competitive if the "know-how" is being provided to potential foreign competitors.

Offset agreements are an important aspect in closing a sale of U.S. arms in the international arms market. In today's competitive environment, the quality and price of a

weapon system are not the only factors involved. Foreign buyers are exceedingly interested in not only purchasing the new weapon system, but also in improving their own industrial and economic position. Offset agreements have become a necessity to compete in the arms market.

The desire on the part of the foreign buyer to improve its own arms production capability has led to globalization of the arms industry. U.S. defense firms must enter into cooperative agreements with either foreign governments or firms to sell their products. This diversification of arms production has led to an interdependence. Indigenous production of weapon systems solely within the borders of a single country may no longer be possible. Each nation is somewhat dependent on others to provide resources, components and subassemblies to manufacture weapon systems and must cooperate with these foreign entities in order to compete in the future.

### **C. THESIS OBJECTIVES**

The objective of this research is to determine the impact of foreign offset requirements, as a condition of purchase for American military material, on the U.S. and the defense industry. It will discuss the emergence of the U.S. as the world leader in the military arms market since the end of World War II and how the U.S. has used security assistance programs as an arm to implement its foreign policy.

An interagency study on offset agreements chaired by the Office of Management and Budget (OMB) will be evaluated to determine the effects offset agreements have had in the past. Its data will be used as a basis to determine the implications offset agreements in the areas of defense preparedness, foreign dependence and technology transfer.

An analysis of the OMB study will be conducted to determine how offset agreements in the past have contributed to the globalization phenomenon. Foreign policy goals and support for NATO allies will be discussed as the motivation behind our implicit support of offset agreements. Additionally, the emergence of Western Europe as a major competitor in the arms market will be discussed, highlighting an increased level of cooperation required of U.S. defense firms in order to maintain access to European arms market.

Lastly, the increase of arms producing countries to include the emergence of the Third World countries as providers of arms to other developing countries and its implications to arms control efforts, caused by offset agreements will be analyzed.

## **D. RESEARCH QUESTIONS**

### **1. Primary**

Do offset requirements, as a condition of a military export sale, have a negative impact on the U.S. national security and the defense industrial base?

### **2. Subsidiary**

- Do offset agreements affect U.S. defense preparedness?
- Do offset agreements increase the level of foreign dependence in U.S. weapon systems?
- What are the consequences of offset agreements that transfer technology abroad for the U.S.?
- How have offset agreements contributed to the globalization of the arms industry?
- What are the implications of globalization for the U.S. defense industry and U.S. national security policy?
- What political pressures are prevalent with offset issues?
- What are the implications of offsets for the defense industry?
- What is the United States policy on Foreign Military Sales and offsets?

## **E. METHODOLOGY**

The methodology for research for this thesis will include literature reviews, interviews with defense industry representatives and review of U.S. Government documents related to offsets published by the Office of Management and Budget, Defense Security Assistance Agency and Departments of Commerce and State. The evaluation of the interagency model will examine the underlying assumptions they used, their methodology and their assessment

of the impact of offset agreements. The results of this evaluation will be used to determine the significance offset agreements have had in the globalization of the arms industry, to include early agreements with NATO and current practices that extend into the Middle East, Asia and Latin America.

The analysis of the interagency study will also include cross referencing their results with other studies available from the Department of Commerce and the Arms Control and Disarmament Agency. The Department of Commerce publishes annual reports that discuss the trade imbalance the U.S. has with its trading partners for both defense and non-defense sectors. Additionally, with the technology transferred to foreign countries in the form of offsets identified in the interagency study, the globalization trend can be analyzed to determine to what extent offset agreements have contributed to it.

The reports available from the Arms Control and Disarmament Agency will also indicate the level of weapon systems production that is being done by foreign countries that were beneficiaries of U.S. offset agreements. In the case of the European consortium, Canada and South Korea, their own defense production capabilities were enhanced by direct offset agreements provided by U.S. defense contractors, resulting in an increased self-sufficiency in defense articles and loss of sales to U.S. defense contractors.

The analysis of the OMB study will provide the basis for determining how offset agreements have been used in the past and their relative impact. The types of offset agreements will also indicate their contribution to globalization of arms production.

## **F. SCOPE OF THESIS**

Some observers view offsets, which have become an important feature of U.S. military sales in recent years, as having a negative impact on national security and the U.S. economy. This view persists even though these sales are entered into voluntarily by the U.S. sellers. This voluntary aspect of offset agreements implies that the sellers of these goods believe they are better off with the sales. This research is designed to evaluate the impact of this belief on the U.S. economy from a macro-economic perspective and its implications for defense preparedness, foreign dependency and technology transfer. Additionally, this research will

extend this evaluation into the international arms market, analyzing its influence on the globalization trend.

This thesis will not evaluate the globalization of the arms industry in detail, rather only the role of offset agreements, as a mechanism of globalization. It will analyze how offset agreements to NATO contributed to the development of a Western European arms industry and how similar agreements between industrialized nations and Third World countries are creating a similar industry in the developing world.

This research will not attempt to determine the true impact of offsets on low tier defense contractors, but rather provide general conclusions on their effects.

## **G. ORGANIZATION**

Chapter II establishes the background of security assistance as an element of foreign policy by examining its historical use by the U.S. from 1776 to the present. It will illustrate, as U.S. prominence as a world power grew, how our foreign policy, and in turn security assistance, has changed. This chapter will also discuss how security assistance programs are administered by the Executive Branch and the influence the Legislative Branch has on its objectives.

Chapter III will provide information on offset agreements as a condition of sale and explain the different types of direct and indirect offset agreements. The prevailing attitude within the Executive and Legislative Branch, as well as the U.S. defense industry will also be presented.

Chapter IV will analyze the 1990 OMB study of offset agreements and their effects on the U.S. economy, defense preparedness, industrial competitiveness and employment.

Chapter V will extend the analysis of the 1990 OMB study into the present time by evaluating how offset agreements concluded during that time period have contributed to the globalization of the arms industry. This chapter will analyze how offsets have helped post-World War II allies and enemies recover economically and militarily from that war. Current trends in offset agreements as they relate to globalization will also be examined to determine their effects on foreign sourcing of components and subassemblies to U.S. produced weapon

systems, erosion of the U.S. technological edge and the increase in the arms producing countries in the world. General observations on how offset agreements have detracted from attempts to counter arms proliferation and production by developing countries will also be evaluated.

Chapter VI draws conclusions from the analysis and provides recommendations on a framework to maintain the U.S. technological edge through research and development efforts, means of measuring U.S. foreign dependence and methods for guarding against critical levels of dependency in weapon subsystems and components. This chapter will also provide methods for controlling the spread of arms production capabilities and arms proliferation originating from the Third World.

## **II. SECURITY ASSISTANCE**

In recent years, the centerpiece of discussion and study within the DoD has been the changing threat to U.S. security. Over the four decades of the Cold War, deterring the threat of Soviet aggression in Europe and containing the spread of communism dominated our security agenda. With the collapse of the Soviet Union and Warsaw Pact, our identifiable foe has been replaced by other, less identifiable threats, such as the proliferation of nuclear weapons, terrorism and ethnic conflicts. Winning two near simultaneous major regional contingencies (MRC) is our strategic objective, but which MRCs remain a mystery. The U.S. has also found itself involved in smaller non-traditional conflicts in Somalia, Rwanda and Haiti. How can the U.S. remain prepared to fight and win the major wars of the future, while maintaining the regional stability throughout the world?

A partial answer to this question can be found in an old answer. To respond to the new world order, the United States should retain its strong military and it should continue to invest in security assistance programs that help to accomplish our national security goals. As this chapter will illustrate, this strategy has helped the U.S. attain its current status as a world power and its continued use will aid in affirming that status in the future.

### **A. SECURITY ASSISTANCE AND FOREIGN POLICY**

One of the primary methods to implement our foreign and national security policy has been the transfer of defense articles, services, military training and economic assistance. Collectively referred to as Security Assistance it is an umbrella term that encompasses a number of military and economic programs. Designed to support our national security and foreign policy, security assistance serves the U.S. interest by assisting allies and friends to acquire and maintain the tools of war, and to use them for self-defense. This assistance is especially important in regions of the world where the U.S. has vested national security concerns. Such assistance is viewed as a means to help other countries attack the causes of economic and political instability. The defense of the free world is a joint endeavor. and as such, the U.S. must continue to maintain its own military capabilities and assist its friends and



allies to strengthen theirs.

In President Reagan's FY1988 budget request to Congress, he included the general objectives and linkage between security assistance and U.S. foreign policy:

For more than forty years, security assistance has been an essential element of U.S. efforts to help build a more secure and peaceful world. Successive Administrations, backed by bipartisan support in Congress, have recognized the indispensable role security assistance plays in the successful conduct of global foreign and defense policies. The U.S. commitment to an effective security assistance effort reflects two fundamental tenets of our post World War II approach to national security and the protection of U.S. interests: a foreign policy based on global engagement and collective security, and a military strategy of deterrence and forward defense. Security assistance is an essential instrument in the implementation and integration of these twin pillars of our national policy. By helping friends and allies to acquire the means to defend themselves, the United States complements the rebuilding of its own military strength and increases the human and material resources available for the defense of free world interests.(DISAM, 1989)

Security assistance is by no means a modern phenomenon, but has been a part of international relations as long as man has been engaged in war. Whether motivated by economic gains or through the realization that a particular combatant is preferable to the other, security assistance attempts to establish and reinforce relationships that are beneficial to the country providing the aid.

## **B. U.S. SECURITY ASSISTANCE HISTORY**

The first U.S. experience with security assistance was unlike the experiences of today. Throughout the American revolution and well into the early days of the U.S. being a new sovereign nation, much of its support was provided from France in the form of arms and other military assistance. The French aid was not entirely altruistic on their part, but rather a means to limit the British expansion in North America. It was in France's own national interest to have Britain's attention directed to a war with the U.S. while the French could expand and reinforce its own military and commercial positions in North America and elsewhere.(Paret, 1986)

Following the War of Independence, the United States focused on the internal development of its political and economic structures. U.S. foreign policy was oriented toward developing markets for U.S. goods and acquisition of materials to support the U.S. industries. Foreign relations continued to be motivated by commercial interests. One exception, conceived by John Quincy Adams, was the Monroe Doctrine. First announced by President James Monroe in 1823, the Doctrine declared that the Americas (North, South and Central) were off limits to incursions from European powers. Any violation of this doctrine would be met by vigorous U.S. actions by whatever means seemed appropriate. The Monroe Doctrine was a significant pronouncement of U.S. foreign policy regarding any real or implied threat not only to the safety of the U.S., but also to its neighbors in the Western Hemisphere. The U.S. appeared to have assumed the regional leadership in the Americas, invoking the principles of the Monroe Doctrine as a precept to U.S. involvement in this region. Examples include the Spanish-American War, acquiring the Panama Canal, U.S. Marines stabilization of Nicaragua and more recently the Cuban Missile Crisis, Grenada and Haiti. (DISAM, 1989)

As the United States grew as a Nation, so did its emergence as an international power. During the early Twentieth century, with the acquisition of Guam, the Philippines and Puerto Rico as a result of the Spanish American War of 1898, U.S. influence extended beyond the confines of our borders or the Western Hemisphere. These events generated much debate as to the direction of the U.S. foreign policy should take. Many saw our policies as dictated by our interests, others considered them as our entrance into a morally questionable world (Kissinger, 1977). The ambivalence of our foreign policy, combined with internal pressures, saw the resurgence of a strong sense of isolationism. With the security of our ocean barriers and few international threats, the U.S. retained its strong convictions against foreign adventurism during the early years of the Twentieth century, a belief that would be soon challenged.

With the onset of World War I, the United States quickly became a leading participant in the international munitions trade. Accounting for more than 52 percent of the global arms export market by 1920, the U.S. during its period of neutrality (1914-1917) exported

approximately \$2.2 billion in war supplies to Europe.(Pierre, 1979) The U.S. engagement in the arms trade, which indirectly contributed to the entry of the U.S. in World War I, was the subject of much debate. The prominent international lawyer, Charles Hyde, petitioned then Secretary of State Lansing to reduce the U.S. arms trade. Hyde stated the U.S. was becoming "... a base of supplies of such magnitude that unless retarded, the success of armies, possible the fate of empires, may ultimately rest upon the output of American factories."(Pierre, 1979). While President Wilson saw the American arms capability as an "arsenal of freedom," the impact of providing arms to friendly or allied nations was not lost on the U.S. foreign policy makers. The U.S., with its past isolationist policies, was not accustomed to the influence such a capability had in shaping world events, but would be one it would use to its advantage in the future.

The period between the World Wars saw the U.S. return to its isolationist policies. With public sentiment supporting a withdrawal from world affairs and the findings of the Nye Committee<sup>1</sup> that the way to stop war was to take away the opportunity for private gain, the U.S. Government took measures that provided for more governmental control and oversight over the U.S. arms market in the form of the Munitions Control Board. The new Board's responsibility also included the adoption of international arms controls, but after some ineffectual efforts, the international arms trade remained unregulated. The Munitions Control Board's effect on U.S. arms exports also had very little impact. In 1936 the U.S. remained third in world arms sales behind France and Great Britain, a position it held until the outbreak of World War II.(DISAM, 1989)

### **C. EARLY SECURITY ASSISTANCE POLICY**

World War II signaled a fundamental change in U.S. foreign policy as it related to the arms trade. Prior to the U.S. entry into World War II, the Neutrality Act was revised in 1939 allowing the sale of arms during peacetime to the British on a cash and carry basis. This

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<sup>1</sup>A Senate Munitions Investigating Committee headed by Senator Gerald Nye investigated if commercial profit motive was the primary cause and continued sustenance of war.

policies were eventually broadened to include arms support for other members of the allied nations. One such broadening of U.S. policy was the Lend-Lease program enacted by Congress on 11 March 1941. Eventually providing about \$50 billion of arms, food and other aid to our allies including China and Russia, the Lend Lease program "lent" materials to Allies under the premise that it would be paid back or replaced in kind by materials provided to the U.S.<sup>2</sup> (DISAM, 1989)

These actions, coupled with the prominent role played by the U.S. in World War II set the stage for the post-war scene dominated by the superpowers, the United States and USSR. Confronted with a diametrically opposed philosophy, subsequent post-World War II Presidents formulated doctrines to combat this new threat. President Truman, under what came to be known as the Truman Doctrine, requested Congress to appropriate \$400 million to aid Turkey and Greece in combating the communist insurrection in March of 1947. (DISAM, 1989) Eventually receiving over \$600 million in aid over the next three years, the U.S. assistance focused primarily on the transfer of surplus U.S. arms free of charge as "grant aid" under the new Military Assistance Program. (DISAM, 1989) The Truman Doctrine, coupled with other programs such as the Marshall Plan, became an essential element of the containment policy to frustrate Soviet attempts to expand their military, political and economic base in Europe.

The containment policy and its role in the Cold War strategy took another turn at the creation of the North Atlantic Treaty Organization (NATO) in 1949. Founded on the Brussels Treaty of 1948 between France, the United Kingdom, Belgium, Netherlands and Luxembourg, the NATO alliance provided the foundation for increased and preferential treatment of NATO member countries for security assistance management, to include: provisions of arms, exclusions from arms control legislation, and international cooperative armaments projects. This preferential treatment accounted for NATO countries in 1965 receiving approximately 56 percent of all American arms transferred under the Military

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<sup>2</sup> For historical interest, less than \$10 billion was repaid to the U.S. for its lend lease contributions.

Assistance Program and Foreign Military Sales Program (Pierre, 1979).

During the 1950s, however, certain new developments changed how that assistance was provided. With World War II stockpiles dwindling, U.S. aid came in the form of technical assistance and industrial equipment to expand local European defense production. Caveated with the agreement that the U.S.-assisted European defense contractors would provide arms at reasonable prices to other NATO member countries, this agreement proved to be short lived. As each country's arms production capability increased, their government demanded arms of local designs, development and production to increase the self-sufficiency of its arms production capability and economic development. NATO member countries were no longer satisfied with purchasing arms from the U.S., United Kingdom and France on the traditional buyer-seller relationship, but were motivated by both national security and economic factors to develop that capability inherently.

The expansion of the U.S. containment policy continued to grow by including the Middle East, Southeast Asia and Latin America. Broadened by doctrines such as the Eisenhower Doctrine<sup>3</sup>, U.S. foreign policy expanded the containment strategy to apply to the protection not only of nations on the periphery of the Soviet Union, but of the world at large, including many nations regarded by their leaders as nonaligned (Farley, 1978). President Kennedy's "Alliance for Progress" provided economic assistance to Latin America to create a stable social structure capable of fending off revolutionary threats, with the implied objective of restraining the expansion of Cuban influence in the region (DISAM, 1989).

It was during the Nixon administration that we find many of the features of present day U.S. security assistance policy formalized. Promulgated under what was termed the Nixon Doctrine was the view that although the U.S. would continue to bear responsibility for the deterrence of nuclear and general war, the responsibility for localized wars remained the responsibility of those countries threatened by it. U.S. assistance would continue in the form of grant assistance, and not necessarily military forces. As summarized by one analyst,

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<sup>3</sup>The Eisenhower Doctrine asserted the right of the U.S. to commit forces to assist any nation in the general region of the Middle East.

The central thesis of the doctrine is that, although the United States will participate in the development of security for friends and allies, the major effort must be made by the governments and peoples of these states. The doctrine was mainly a product of public reaction against the major but largely unsuccessful military intervention by the United States in Vietnam during the 1960s. As policy, its promulgation was directly related to efforts of the Nixon Administration to extricate American forces from Indochina (Plano and Greenburg, 1976).

U.S. material military assistance continued to grow during the early 1970s. With regional instability evident in the Middle East, U.S. transfer of arms to Iran, Israel and Saudi Arabia, and additional arms exports from France and Great Britain, a seemingly uncontrollable arms race appeared to be occurring. With the post-Vietnam War experiences still fresh in their minds, U.S. public awareness increased. Congress moved to legislate greater control over the future transfer of arms, resulting in the Arms Export Control Act (AECA)<sup>4</sup> which has had a significant influence on all subsequent security assistance management. The AECA, considered by Presidents Ford and Carter as extremely restrictive and impinging on the Executive Branch's prerogative to implement foreign policy, signaled congressional assertion of a major role in the foreign policy arena and ushered in a new era where arms transfers conducted under the guise of foreign policy would be subject to increased congressional oversight.

#### **D. PRESENT SECURITY ASSISTANCE POLICY**

Under the Reagan, Bush and Clinton Administration, the basic tenant of arms transfers as a means to support national interests remains essentially unchanged from those of previous administrations. President Reagan, however, on 8 July 1981 announced a new Conventional Arms Transfer Policy which viewed arms transfers as an essential element of our global defense policy and an indispensable component of U.S. foreign policy. President Reagan's

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<sup>4</sup>The Arms Export Control Act essentially prohibited arms transfer to nations found in systematic violation of human rights.

views reflected a more pragmatic view of security assistance and included the following points:

- Reinforce military capabilities to assist in the deterrence of aggression, especially from the USSR and its surrogates and reduce the requirement for direct U.S. involvement in regional conflict.
- Reinforce the perception of friends and allies that the U.S., as a partner, is also a reliable supplier with a measurable and enduring stake in the security of the recipient country.
- Point out to potential enemies that the U.S. will not abandon its allies or friends or allow them to be militarily disadvantaged.
- Improve the American economy by assuring a more stable defense production base, and by enhancing the balance of payments. However, this objective should not be construed that the approval of the transfer of arms will be based solely or even primarily on economic consideration and gain.
- Enhance the effectiveness of the U.S. military through improved possibilities of access to regional bases, ports, or facilities needed for support of deployed forces during contingencies. Further, security assistance should be such as to improve the ability of the host nations to complement U.S. forces during deployments.
- Strengthen the stability of a region and the internal security of the countries therein by fostering a sense of a recipient nation's security and thereby its willingness to settle disputes amicably. Through this objective, it is held that a government which feels secure is more likely to cope with such challenges in a more progressive and enlightened manner.

A pivotal point of the Reagan policy was that the U.S. would assess the transfer of arms in light of the net contribution such transfers make to U.S. global or regional security. His policy specifically states that economic interests would not be the sole or primary reason behind such a transfer. This distinction will prove to be an issue with a Congress that does not feel foreign policy is outside of their realm of influence or responsibility.

## **E. U.S. SECURITY ASSISTANCE PROGRAMS**

As noted above, security assistance is an umbrella term that means different things to different people. For the purposes of this research, the following DoD definition of security assistance, will be used:

Groups of programs authorized by the Foreign Assistance Act of 1961, as amended, and the Arms Export Control Act of 1976, as amended, or other related statutes by which the United States provides defense articles, military training, and other defense related services, by grant, credit, or cash sales, in furtherance of national policies and objectives. (JCS Pub 1, 1987)

The U.S. security assistance program is comprised of seven major component programs. (DISAM, 1989)

- Foreign Military Sales (FMS) and Foreign Military Construction Sales Program
- Foreign Military Financing Program
- Commercial Sales Licensed under the AECA
- Military Assistance Program (MAP)
- International Military Education and Training (IMET) Program
- Economic Support Fund
- Peacekeeping Operations (PKO)

For purposes of this research, the focus will be on the top three components. These are defined as follows (DISAM, 1989).

### **1. Foreign Military Sales (FMS)**

FMS is a non-appropriated program through which eligible foreign governments purchase defense articles, services, and training from the United States Government.



## **2. Foreign Military Financing (FMF) Program**

The FMF program is authorized under the provisions of Sections 23, 24 and 31 of the AECA and originally served to provide an effective means for easing the transition of foreign governments from grant aid to cash purchases. Currently the FMF program provides funds to recipient countries to be used for purchases of U.S. arms. FMF funds are either provided as grants or loans at concessional (reduced interest) rates.

## **3. Commercial Sales Licensed under the AECA**

A commercial sale licensed under the AECA is a sale made by U.S. industry directly to a foreign buyer. Unlike procedures employed for FMS, the commercial sale transaction are not administered by DoD and do not involve a government to government agreement. The U.S. Government control procedure is accomplished through licensing by the Office of Munitions Control, Department of State. Day to day rules and procedures for these types of sales are contained in the International Traffic in Arms Regulations (ITAR).

## **F. U.S. GOVERNMENT ORGANIZATION FOR SECURITY ASSISTANCE**

The U.S. Security Assistance Program was created by U.S. public law. While the administration of security assistance is vested in the Executive Branch, the Congress, by virtue of Article 1, Section I of the U.S. Constitution, which gives it all legislative power, exerts influence in several ways:

1. Development, consideration and action on legislation to establish or amend basic security assistance authorization acts.
2. Enactment of appropriation acts.
3. Passage of Joint Resolutions in the form of a Continuing Resolution Authority (CRA) to permit the incurrence of obligations to carry on essential security assistance program activities until appropriation action is complete.
4. Hearings and investigations into special areas of interest, to include instructions to the General Accounting Office (GAO), the Congressional Budget Office (CBO), and Congressional Research Service (CRS) to accomplish special reviews.
5. Ratification of treaties which may have security assistance implications. (DISAM, 1989)

Additionally, Congress is assigned power by Article I, Section 8 of the Constitution to regulate commerce with foreign nations, while Article IV, Section 3 indicates that the "Congress shall have Power to dispose of and make all needful Rules and Regulations respecting the Territory or other Property belonging to the United States". (DISAM, 1989)

Congress performs these responsibilities through its committees of both Houses of Congress. The primary committees of Congress involved with security assistance legislation are: (DISAM, 1989)

**1. Authorizations:**

a. House of Representatives, Committee on Armed Services, Committee on Foreign Affairs.

b. Senate, Committee on Armed Services, Committee on Foreign Relations.

**2. Appropriations**

a. House of Representatives, Committee on Appropriations (Subcommittees on Foreign Operations and Defense).

b. Senate Committee on Appropriations (Subcommittees on Foreign Operations and Defense).

The Executive Branch's organizational structure is far more diverse. The management of security assistance encompasses the Departments of State, Treasury, Commerce, DoD, the Unified Commanders and the military departments. The Departments of Treasury and Commerce exercise authority over security assistance programs through their control measures to include export clearance and critical commodity controls. The key players, however, are the State Department and DoD. Figure 1 provides a depiction of the U.S. Government organization for Security Assistance. (DISAM, 1989)

**G. DOD ORGANIZATION FOR SECURITY ASSISTANCE**

By law, the Secretary of State is responsible for the "continuous supervision and general direction" of the security assistance program (DoS Pub 8869, 1976). However, the Department of Defense has the largest supportive role of any Department or Office (e.g.,

# SECURITY ASSISTANCE ORGANIZATIONAL STRUCTURE

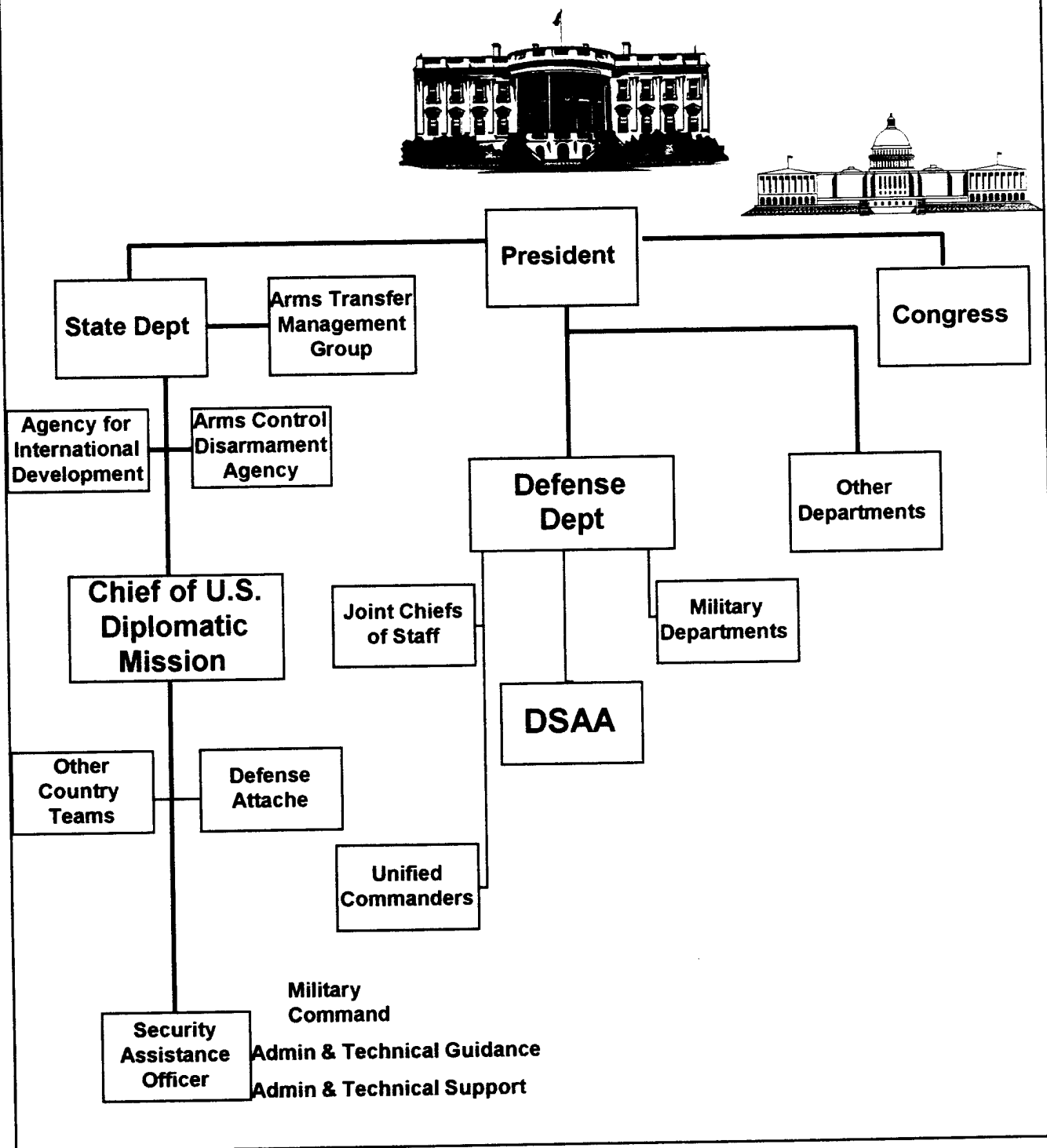


Figure 1

Departments of Defense, Treasury, Commerce, Office of Management and Budget, etc). As prescribed by the Foreign Assistance Act and the Arms Export Control Act, the Secretary of Defense has the primary responsibility for:

1. The determination of military end-item requirements;
2. The procurement of military equipment in a manner which permits its integration with service programs;
3. The supervision of end-item use by recipient countries;
4. The supervision of the training of foreign military and related civilian personnel;
5. The movement and delivery of military end-items;
6. The establishment of priorities in the procurement, delivery and allocation of military equipment.
7. Within the Department of Defense, the performance of any other functions with respect to the furnishing of military assistance, education, training, sales and guarantees. (DoDDir 5132.3, 1988)

The Office of the Secretary of Defense accomplishes its responsibilities through the designation of various Under Secretary and Assistant Secretaries with duties and responsibilities associated with security assistance. These offices include the following:

1. Under Secretary of Defense for Policy. This official serves as the principal adviser and assistant to the Secretary of Defense for all matters concerned with the integration of Departmental plans and policies with overall national security objectives, and exercises direction, authority and control over the Director of the Defense Security Assistance Agency (DSAA).
2. Assistant Secretary of Defense (International Security Affairs). The office within the Defense Department charged with the responsibility for supervising security assistance programs for other non-NATO European countries is the Assistant Secretary of Defense/International Security Affairs (ASD/ISA).
3. Assistant Secretary of Defense (International Security Policy). This office oversees DoD activities related to NATO and other European countries, including

supervision of associated security assistance programs, and directs and coordinates the technology transfer review process.

4. Assistant Secretary of Defense (Production and Logistics). The major function of this office is to ensure that DoD logistics policy and procedures are effectively integrated with security assistance. It is the policy and procedural body for security assistance functional areas to include cooperative logistics supply support and international co-production agreements.

5. Director, Defense Research and Engineering. This official assures considerations of rationalization, standardization and interoperability in security assistance programs with NATO allies, provides analysis of the risk of compromise of U.S. weapon systems and participates in the technology transfer review process.

6. Assistant Secretary of Defense (Comptroller). This office is responsible for the establishment of policy and procedures involving financial management, fiscal matters, accounting, pricing, auditing and international balance of payments related to security assistance. (DoDDir 5132.3, 1988)

In general, the Office of the Secretary of Defense is charged with the promulgation of the executive level policies and procedures related to security assistance. To assist OSD, the Chairman of the Joint Chiefs of Staff (CJCS) is a key participant in the development and review of the security assistance programs. Aided by his Unified Commanders<sup>5</sup>, the CJCS, coordinates security assistance with U.S. military plans and programs, recommends selection, introduction or redistribution of weapons systems in and among recipient countries and determines the impact of security assistance programs on U.S. programs and defense readiness. (DoDDir 5132.3, 1988)

At the grassroots level, under the command and supervision of their respective CINCs are the security assistance organizations (SAO). Charged with the responsibility of logistics, fiscal and contract administration management, the SAO maintains liaison with DOD components, appropriate elements of the U.S. Diplomatic Mission and the foreign defense

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<sup>5</sup>Five of the unified commands have responsibilities for the conduct of U.S. security assistance programs. They are the U.S. European Command, Pacific Command, Southern Command, Atlantic Command and the Central Command.

organization. The SAO is the U.S. agency that interacts with the foreign country on a day to day basis and is normally attached to the diplomatic mission either as a SAO or as part of a military advisory group (MAG). The SAOs are the hands-on organization within the security assistance bureaucracy. They are normally the initial recipient of a foreign country's request for security assistance, and oversee existing security assistance programs with the recipient country. (DISAM, 1989)

## H. FOREIGN MILITARY SALES PROCESS

The focus of the security assistance program with any country is the cohesion of the U.S. and foreign purchaser's policy objectives. Any assistance provided by the U.S. must not only strengthen the recipient country's objectives, but more importantly strengthen our own national security and promote world peace. The commonality of objectives represents the first litmus test a potential foreign military sale must pass. Based on the nature of the request, the military department having cognizance over the defense article or service will normally receive a Letter of Request (LOR) from the foreign country through U.S. diplomatic

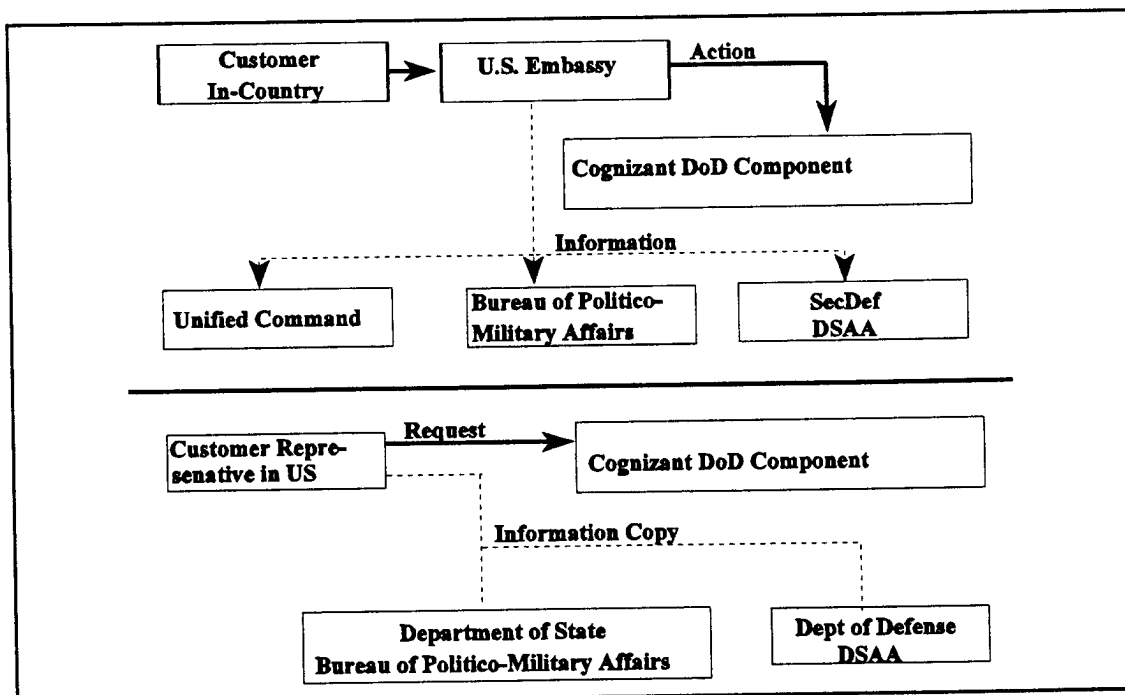


Figure 2

channels. Figure 2 shows the channels for submissions of LORs.

Once the LOR has been received by the military department, the request must be validated to ensure that the potential customer is an eligible FMS recipient, that the article or service sought may be sold and that the request has been received through proper channels. The Defense Security Assistance Agency (DSAA) maintains a military articles and services list (MASL) which identifies the military articles and services eligible for FMS. If the item requested is not on the MASL, a policy level decision must be made.

Provided the LOR has cleared the initial screening, the military department will draft a Letter of Offer and Acceptance (LOA) which will in turn be reviewed by the DSAA and initial approval provided by the Department of State. During the Department of State's review of the LOA, Congress can also be notified of the impending sale. Although not a statutory requirement, it provides Congress with a 20 calendar day advance notification to allow for preliminary congressional examination. Once the 20 days has expired, DSAA submits the formal 30 day notification to Congress required by the Arms Export Control Act. The onus is upon Congress to act if it objects to the LOA. If Congress fails to object to the proposed sale within 30 days, the DSAA submits the LOA to the requesting government for its review and acceptance/rejection. (DoD 5105.38M, 1989)

The means by which the U.S. Government fulfills its obligations of the FMS programs vary according to the article or service requested. In the instance of military articles, the requested item can be provided from military surplus or government stocks. For procurement items from new production, the FMS requirements may be consolidated with DoD requirements or contracted separately.

## **I. SUMMARY**

This chapter has traced the history of security assistance from its early days during the revolutionary war to today. It has illustrated the evolution of our security assistance objectives and how they relate to our own national security objectives. Prior to World War II, with U.S. foreign policy characterized by an isolationist theme, security assistance was very limited and essentially oriented towards the Western Hemisphere as exhibited by the

Monroe Doctrine. The allied victory of World War II and the emergence of the U.S. and USSR as the world's superpowers saw the emphasis of security assistance shift to a global perspective. Designed to contain communism, U.S. aid to friendly and allied countries increased dramatically over the ensuing years and increasingly became a major component of our foreign policy.

The conclusion of the Vietnam War, coupled with public sentiment at the time, compelled Congress to become an active participant in the implementation of U.S. foreign policy. Concerned with the U.S. becoming embroiled in "another Vietnam", Congress amended the Foreign Assistance Act and Arms Export Control Act, charging the Executive Branch with specific responsibilities to clarify its policy on arms assistance and to establish organizations to provide security assistance management. From this legislation, the Defense Security Assistance Agency was established, providing the bulwark of effort for DoD-related security assistance to foreign countries.

Congressional interest and executive level scrutiny of security assistance related to sales of U.S. arms to foreign countries inevitably comes with a large degree of bureaucracy given the number of reviews necessary for a request to be approved. The recipient country cannot exercise the same degree of influence on weapons procurement as they could if the arms were produced in their country or if the contractual relationship was directly between themselves and the U.S. defense contractor. DoD has been interposed between the foreign country and the defense contractor, further complicating the acquisition process from the foreign country's perspective. This relationship is not entirely beneficial for the foreign country. When combined with the institutional maze that a request must move through and the perceived dependence on the U.S. for defense articles, it provides the origins of the break from the traditional buyer - seller relationship and the desire for the recipient countries attempt to derive some additional benefit. Chapter III will discuss this new trade practice and the reactions from the Executive Branch, Congress and the defense industry.





### **III. OFFSETS, POLITICAL AND ECONOMIC IMPLICATIONS**

#### **A. INTRODUCTION**

In the previous chapter, the origins of foreign military sales in the United States was traced from its roots during the Revolutionary War, where the fledgling U.S. Government was the recipient of French arms and supplies, to its current state. The theme that existed then, continues today that is, one of a common means, in the form of arms, used to accomplish different national objectives. The U.S. does not provide arms to foreign countries solely from an economic perspective. The foreign military sales process is founded on the assumption that U.S. military aid provides for regional stability and world peace, while improving a particular nation's self-defense capability. By investing in a foreign country's self-defense capability, the U.S. benefits by having an allied or friendly country as a stabilizing force in various regions of the world.

Similar to France's motives in the Revolutionary War, the U.S. motives are not altruistic. Our motives serve our national security interests. The benefits derived are also not necessarily equal in value. The recipient country may receive relatively modern defense material; however, it does not contribute to their economic well-being on the same scale as it does the U.S.

From this imbalance of benefits comes the idea of offsets. Essentially, offset agreements are between a foreign country and a U.S. defense company which is in contrast to the traditional foreign government to U.S. Government relationship associated with FMS. They are designed to do exactly what the name implies, i.e., offset the cost of the sale in some direct or indirect form that is beneficial to the recipient. The seller is compelled by the buyer to enter into a compensating or reciprocal relationship. This condition is referred to as countertrade for civilian goods, but when the sale is of a military nature, offset is the accepted term.

## **B. OFFSETS**

Offsets are a range of industrial or commercial compensations required as a condition of purchase in either government to government or commercial sales of defense articles and/or defense services as defined by the Arms Export Control Act (AECA) and the International Traffic in Arms Regulations (ITAR). The different types of offsets are:

1. Coproduction: Overseas production based upon a government to government agreement that permits a foreign government or producer(s) to acquire the technical information to manufacture all or part of a U.S. origin defense article.
2. Licensed Production. Overseas production of a U.S. origin defense article based on transfer of technical information under direct commercial arrangements between a U.S. manufacturer and a foreign government or producer.
3. Subcontractor production. Overseas production of a part or component of a U.S. origin defense article.
4. Overseas Investment. Investment arising from the offset agreement, taking the form of capital invested to establish or expand a subsidiary or joint venture in the foreign country.
5. Technology Transfer. Transfer of technology that occurs as a result of an offset agreement and that may take the form of research and development conducted abroad, technical assistance or other activities under direct commercial arrangement between the U.S. manufacturer and a foreign entity.
6. Countertrade. An agreement involving the reciprocal purchase of civil or defense goods and services from the foreign entity as a condition of sale of military-related exports.
7. Counterpurchase. An agreement by the initial exporter to buy (or find a buyer for) a specified value of unrelated goods from the original importer during a specified time period.
8. Compensation. An agreement by the original exporter to accept as full or partial repayment goods derived from the original exported product (e.g., turnkey factory, machinery or equipment used to produce military articles). Agreements for repayment in related goods are often referred to as "buy-backs". (DISAM, 1989)

Within the arms industry, offsets associated with military exports are frequently divided into direct and indirect classes.

1. Direct Offsets. Contractual arrangements that involve goods and services referenced in the sales agreement for military exports.
2. Indirect Offsets. Contractual arrangements that involve goods and services unrelated to the exports referenced in the sales agreement.

Offsets result from a number of economic, political and security considerations on the part of the buyer. One of the first government-to-government agreements involving offsets was that of Norway for an FMS purchase of the TOW missile system and tracked vehicles in 1968. The Memorandum of Understanding (MOU) placed the primary burden on DoD to offset 25 percent (\$50 million) of Norway's \$200 million purchase (DISAM, 1989). Similar agreements with the United Kingdom, Australia and the Swiss government were entered into by DoD. Although the minimum offset targets were met in each case, difficulties encountered by DoD, as well as the increased pressure allies were bringing to bear for offsets, led to the 1978 Duncan Memorandum, specifying that DoD would not be a party to satisfy commitments for offsets or compensatory coproduction.

The Duncan Memorandum, issued by then Deputy Secretary of Defense Charles Duncan, established the guiding principles for what was to become U.S. policy on offsets. The memorandum stated:

Because of the inherent difficulties in negotiating and implementing compensatory coproduction and offset agreements and the economic efficiencies they often entail, DoD shall not normally enter into such agreements. An exception will be made only when there is no feasible alternative to ensure the successful completion of transactions considered to be of significant importance to the United States national security interests. (DISAM, 1989)

The basic policy in the Security Assistance Management Manual published by the Defense Security Assistance Agency (DSAA) puts the basic policy this way:

It is DoD policy not to enter into government-to-government offset arrangements because of the inherent difficulties in negotiating and implementing such arrangements. Any foreign government requesting offset should be informed that the responsibility for negotiating any offset arrangements reside with the U.S. contractor involved. The U.S. Government will not commit a U.S. contractor to an offset commitment without having its prior concurrence. (SAMM, 1988)

An example of a program governed by this policy is the Canadian F/A-18 procurement. In this program, McDonnell Douglas granted nearly 100 percent offsets, including coproduction (direct offset), establishment of non-F/A-18 related industrial capabilities in Canada and marketing of Canadian goods and services (indirect offsets). Even though DoD was not directly involved in the offset package or the sale, the U.S. Navy F/A-18 program derived production cost reductions in their own procurements<sup>6</sup> and the U.S. security interests were strongly served by Canadian acquisition of this high performance aircraft for use in North American air defense.(DISAM, 1989)

### **C. CONGRESSIONAL CONCERNS - IMPACT OF OFFSETS**

The increasing number of offset and countertrade arrangements did not go unnoticed by Congress. Concerned with the potential political impact that this trade practice could have on the competitive position of U.S. industries, congressional hearings were held and studies by the General Accounting Office requested to evaluate the influence offsets in foreign military sales (FMS) had on the defense industrial base. In a July 1985 report on this issue, following a hearing by the Subcommittee on Economic Stabilization of the House Committee on Banking, Finance and Urban Affairs, the following concerns were registered:

Increasingly, such arrangements are required by foreign buyers as a condition of the sale in order to counter or offset the economic impact of the sale on the

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<sup>6</sup>The Canadian F/A-18 procurement allowed McDonnell Douglas to allocate their overhead costs across the Canadian contract, as well as the U.S. Navy Contract, thus achieving economies of scales.

purchasing country. These arrangements take many specific forms, including requiring subcontracting to firms in the purchasing country, coproduction of certain items, technology transfer or the purchase of goods from the buyer country by the U.S. seller.

While the specific mechanisms differ, the purpose is the same: to help the economy of the purchasing country, its industrial base, its employment, and its balance of payments. It is increasingly apparent that the impact on our own industrial base, our own employment, our own balance of payments and ultimately, the competitive position of our industries is substantial.

The House of Representatives appeared to take the lead on this issue, due primarily to their smaller constituency and districts where subcontractors, more apt to feel the effects of offset agreements, are located. In 1984, the House passed a bill that became an amendment to the Defense Production Act (PL 98-265) requiring the President to report annually on the impact of offsets on U.S. defense preparedness, industrial competitiveness, employment and trade. Section 309 of the Defense Production Act (DPA) amendments of 1984 were approved on 17 Apr 1984 and read:

Not later than 18 months after the date of the enactment of the Defense Production Act amendments of 1984, and annually thereafter, the President shall submit...a report on the impact of offsets on the defense preparedness, industrial competitiveness, employment and trade of the United States. Such report also shall include a discussion of bilateral and multilateral negotiations on offsets in international procurement and provide information on the types, terms and magnitude of the offsets.

The conferees intend that information provided on terms, types and magnitude of the offsets in each report shall include the number of relevant offset agreements required by contract, the total dollar amount of the value of offsets required by such contracts, a breakdown of offsets by category of defense material or defense services involved in such contracts, and a breakdown of such offsets by recipient countries.

In addition, each report shall contain a summary of relevant Memoranda of Understanding between the United States and foreign countries which provide the official framework within which foreign offset commitments incurred in private sales can be fulfilled. Copies of actual Memoranda of Understanding

involving such offsets shall be made available to the House and Senate Banking Committees upon request, after each report has been submitted by the President. (DISAM, 1989)

Subsequent congressional action came in the form of the National Defense Authorization Act, Fiscal Year 1989 (NDAA 89). Section 825 of this Act restated concerns regarding the impact offsets could have on the U.S. defense industrial base, the transfer of U.S. technology abroad and the possible undermining of U.S. contractors and subcontractors' competitive edge. Additionally, Section 825 of the NDAA 89 amended Title 10 by adding Section 2505 to Chapter 148 of Title 10, United States Code. The essence of this amendment was to press the President of the United States to "...establish a comprehensive policy with respect to contractual offset arrangements in connection with the purchase of defense equipment or supplies..." (OMB, 1990). This amendment addressed the issues of technology transfer in connection with offset arrangements, the effects of these arrangements on specific subsectors of the industrial base of the United States. It required the President to enter into negotiations with foreign countries that have a policy of requiring offset arrangements in connection with the purchase of defense equipment or supplies from the United States to achieve an agreement to limit the adverse effects such arrangements have on the defense industrial base of each such country. Lastly, Section 2505 required that the President submit a comprehensive report to Congress addressing the following points:

1. An analysis of the amount and type of contractual offsets required of United States firms by the governments of foreign countries or by foreign firms.
2. An assessment of the benefits for and costs to United States manufacturers of defense products at all tiers that result from requirements of foreign governments for contractual offset arrangements in the case of products procured from United States firms.
3. An assessment of the benefits for and the cost to United States manufacturers of defense products at all tiers that would result from restrictions of the ability of foreign governments or foreign firms to require contractual offsets in the case of defense products procured from United States firms.

4. An assessment of the benefits and costs of a United States policy that requires reciprocal offsets in the procurement of defense products from those countries whose governments have a policy of requiring contractual offsets in the case of defense products procured from United States firms.

5. An assessment of the impact that elimination of contractual offset requirements in international sales of defense products would have on the national security of the United States.

6. Recommendations for a national policy with respect to contractual offset arrangements. (OMB, 1989)

Congress has taken distinct and visible steps towards possible legislation to mitigate the effects of offset arrangements. Designed primarily to analyze their impact, Congress very clearly signaled to the Executive Branch their interest in this subject area and their intent to act if the Executive Branch did not establish measures to limit the debilitating effects offset arrangements can have. This intent was clearly demonstrated in congressional hearings where Congressmen espoused the need for statutes prohibiting offsets arrangements as a condition of a FMS. The Honorable Barbara Kennelly, Representative in Congress from the State of Connecticut introduced a bill, H.R. 1652, in March, 1987 calling for the President to enter into bilateral or multilateral negotiations with appropriate foreign governments for the purpose of disciplining direct and indirect offset conditions. The intent of the bill was to form an alliance of countries who provide offsets to counter the ongoing abuses in the offset system. (Kennelly, 1987)<sup>7</sup>

The congressional testimony and general feeling of Congress sent warning signals throughout the U.S. defense industry, who mobilized their own lobbying forces to temper any such action.

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<sup>7</sup>H.R. 1652 was not passed by Congress; however, similar language requiring the President to enter into bilateral or multilateral negotiations was included in the NDAA, FY89.



#### **D. DEFENSE INDUSTRY REACTION**

The actions of Congress preceding the enactment of the amendments to the DPA were of visible concern to the top defense contractors in the United States. Their concern originated from the possibility that if Congress passed legislation prohibiting offset arrangements, such laws would place the contractors at a disadvantage when selling their wares to foreign countries. Long viewed as just a part of doing business in the international arms market, defense contractors realized that offsets can be a crucial element in making the sale. In the words of Richard Albrecht, executive vice president of Boeing, "... 60 percent of something is better than 100 percent of nothing" (Johnson, 1990). Mr. Albrecht's statement illustrates the simple truth that in the competitive world arms market, if one company is willing to make concessions, other companies will have to, unless their product is so unique that they have no other competition.

In today's competitive markets, the United States has strong competitors for most U.S. products. In the defense arena, specifically, U.S. sales of defense equipment in the international market has declined over the past 10 years.(Johnson, 1987) This decline can be attributed to a reduction in arms purchases not only in the U.S., but in most of the developed countries in the world. Despite a decrease in demand, additional suppliers have emerged in the marketplace. Traditional competitors such as the former Soviet Union, France and the United Kingdom have been joined by Israel, Brazil, Italy and Spain, all vying for a greater market share. From the defense industry's perspective, the issues is not whether to accept a deal with or without offsets. The question, given the current competitive international environment, is between business with offsets or no business at all. (Johnson, 1987).

Much of the conflict over offsets is the concern that U.S. defense companies are accepting offsets irrespective of their implications on the U.S. economy. These defense companies do, after all, exercise a considerable degree of control over the offsets they accept. A company only makes or accepts offers which will leave it better off than it would have been without the business. This control extends into the technology or subcontracting work transferred to a foreign country. U.S. defense companies are very sensitive to the fact that

by transferring "state of the art" technology or manufacturing "know-how" abroad they undermine their own competitive position. These types of transfers are very popular offset objectives of foreign countries intent on improving their own self-sufficiency. U.S. companies recognize the long-term consequences of this practice and will only enter into such agreements when they have something even better in the development stage for near-term incorporation into the production process.

The term U.S. defense company has a broad definition and perhaps requires clarification. In the arena of offset agreements, the defense companies most affected are those that are prime contractors, top tier corporations that develop, produce and sell weapon systems to the U.S. and foreign countries. Companies such as Boeing, McDonnell Douglas, Lockheed and General Dynamics are all active participants in the offset environment. While they actively participate in the development of and agreement to offset provisions, they are not likely to be on the receiving end of the offset agreements. As stated previously, the large defense companies will not agree to offset provisions that leave them worse off than they were. Requirements to produce a portion of a weapon system offshore must cost less than it would to produce in the U.S. or be compensated for in the price of the contract. Indirect offset requirements such as selling a recipient countries exports in the U.S. must adhere to sound business practices. The prime defense contractors will not be caught with the short end of the stick, this does not necessarily mean that a lower tier U.S. defense subcontractor is not worse off.

From an macroeconomic perspective, the U.S. defense companies contend that sales with associated offsets are on balance favorable for the U.S. economy. This conclusion is in agreement the other studies by the International Trade Commission and the Office of Management of Budget to be discussed later in this chapter. They also point out in the macro sense that for every export, at some time from some place there must be an import of equal value. While offsets seem to specify the product and the country, it does not change the overall economic requirement that exports and imports must balance over the long run.

In their examination of microeconomic areas such as employment, technology transfer

and erosion of the industrial base, the U.S. defense companies generally argue that there is not, overall, an adverse effect attributable to offsets. While an offset agreement requiring a certain portion of subcontracting work be performed in the recipient country does in fact cost U.S. jobs, if not for the offset agreement the sale would have likely gone to an overseas producer, and no work would have been created in the United States. By sacrificing some U.S. jobs, they were able to retain others. In the area of technology transfer and aiding their future competition, the U.S. defense companies fall back on their previous assertion that their focus is not the protection of current technology but rather in the development of more advance technology. Defense companies also note that the vast bulk of process-technology transfer occurs through normal commercial transactions, not through offsets (Johnson, 1987). Companies that specialize in manufacturing not only build facilities in the U.S. but also abroad. Through these transactions then, the U.S. encourages the export of machine tools to aid other countries ability to manufacture goods that ultimately compete with U.S. goods.

U.S. defense companies recognize that offsets are an aberration of the free market system but no more than any other distortion to the market caused by subsidized export credits, tariffs and import restrictions. They are all a departure from the perfect world where two variables, quality of the product and its price, determine the success or failure of a product. Offsets are nothing more than the countertrade practices that have been prevalent in the commercial marketplace. Rebates, low interest financing and special option packages are all examples of "offsets" expected by consumers when contemplating a major purchase. Such is the case with foreign countries. Confronted with a purchase with taxpayers' funds of expensive, highly visible foreign products that are a major burden on the country's economy, governments are inclined to demonstrate to the public that they have obtained the best possible deal in the terms of price, jobs, sales of domestic products and technology transfer.

This position is not unlike certain U.S. Government requirements. While we do not make formal offset demands, DoD generally requires that any major defense system bought from offshore suppliers ultimately be manufactured in the U.S. In the case of the M9 9mm pistol purchased by U.S. Army from the Italian manufacturer Beretta, the contract required

that the technology to manufacture the pistol be transferred to the U.S. in three phases. During the first year of operations, fully completed pistols would be imported from Italy. In the second year, all assembly and testing would be done in the U.S.. During the third year, the frame, slide and barrels would be manufactured in the U.S. As a result, during the five years of this contract, approximately 66 percent of the value of the contract came to U.S. industry. (OMB, 1986) DoD's requirement is justified on national security grounds, however, from the viewpoint of the foreign supplier it appears to be an offset requirement.

The defense industry's concern regarding offset legislation stems from fear that any legislation aimed at countering such practices would simply result in the customer turning to another supplier who is not encumbered by offset restrictions. While they oppose the U.S. Government adopting unilateral provisions restricting offset agreements, they endorse steps taken in a bilateral or multilateral fashion. Their recommendations obviously originate from their desire to compete in the marketplace and long term survival, but they found an ally within the Executive Branch of the U.S. Government, whose motivation was not a profit and loss statement but one of national security and its responsibilities as a world superpower.

## **E. EXECUTIVE BRANCH POLICIES**

The Duncan memorandum, described above, became the basis for U.S. policy regarding offsets until the passing of the National Defense Authorization Act of 1989. With this Act, Congress established a statutory requirement to publish a policy on offsets in military exports. Since the Reagan administration was coming to a close, the policy requirement was passed to the incoming Bush administration. Headed by General Scowcroft, President Bush's national security advisor, a National Security Council ad hoc working group<sup>8</sup> was chartered to prepare an appropriate policy statement. This interagency working group solicited comments from defense industry and other groups, completing its work on 5 Mar 1990. President Bush's policy was announced on 16 Apr 1990, it read in part:

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<sup>8</sup>The interagency working group was comprised of representatives from the Departments of State, Defense, Labor, Commerce and Treasury.

No agency of the U.S. Government shall encourage, enter directly into, or commit U.S. firms to any offset arrangements in connection with the sale of defense goods or services to foreign governments.

U.S. Government funds shall not be used to finance offsets in security assistance transactions except in accordance with currently established policies and procedures.

Nothing in this policy shall prevent agencies of the U.S. Government from fulfilling obligations incurred through international agreements entered into prior to the issuance of this policy.

The decision whether to engage in offsets, and the responsibility for negotiating and implementing offset arrangements, resides with the companies involved.

Any exception to this policy must be approved by the President through the National Security Council.

The President also noted that the time has come to consult with our friends and allies regarding the use of offsets in defense procurement. He has, therefore, directed the Secretary of Defense, in coordination with the Secretary of State, to lead an interagency team to consult with foreign nations with a view to limiting the adverse effects of offsets in defense procurement. This interagency team will report periodically on the results of these consultations and forward any recommendations to the National Security Council. (OMB, 1990)

President Bush's policy on offsets did not change how the Executive Branch viewed offsets and arms transfer policies from the previous administration. This continuity continues. Deputy head of Export Control Policy in the Department of State George Gowan indicated that the new U.S. Conventional Arms Transfer policy, to be signed by President Clinton, is not expected to deviate from that of former Presidents Reagan and Bush. (Defense News, 24-30 Oct 1994).

In the context of the U.S. arms transfer policy, the Executive Branch views offsets as an economically inefficient irritant. However, they are a marketing technique and a form of export financing. Realizing that the government making the arms purchase has objectives

beyond procuring arms at a cost effective price such as political acceptability, the maintenance of domestic defense and commercial industries and preserving foreign exchange, it follows that the United States arms export and offset policies have considerations influenced by foreign policy/national security concerns that may conflict with economic efficiency.

Arms transfers, including in some cases offset agreements, enhance the preparedness of allies and friends by providing them with the tools to defend themselves. Cooperative agreements, coproduction and licensed production contribute to our allied preparedness by enhancing their allies ability to contribute the productive capacity of the alliance. This rationale has been used extensively throughout the NATO alliance.

Arm transfers, when combined with basing or access rights for U.S. forces on foreign soil, facilitate U.S. power projection capabilities. Offsets can indirectly contribute to this capability. If the offset provisions were not agreed to, the sale or transfer of arms would not have occurred, thereby denying the U.S. possible access rights.

Coproduction and licensed production offset agreements promote rationalization, standardization and interoperability with our allies by providing for the use of a common weapon systems. These types of agreements provide our allies with incentives to standardize common systems, and enhance the ability of allies to maintain and support the systems of other alliance members.

Offsets directly contribute to foreign sales, but also reduce the cost of DoD purchases by allowing U.S. producers to allocate overhead costs across a large base, thus contributing to economies of scale. The additional business also enhances the overall health of the U.S. defense industrial base.

The previous paragraphs discuss the prevailing views of the Executive branch regarding the benefits of an arms transfer policy and clearly illustrate how they traditionally emphasize the foreign policy and national security aspects over some U.S. economic concerns. As a consequence, the emerging mood within Congress concerning the adverse effects of offsets, coupled with their view that the development of foreign policy was not solely the domain of the President, the Executive Branch was increasingly required to defend

its policies. Such a justification of their policy is represented by the annual report on offsets in military exports required by the 1986 amendments to the Defense Production Act of 1984 and the National Defense Authorization Act, FY 1989.

#### **IV. OFFSETS IN MILITARY EXPORTS, THE OMB STUDY**

This chapter will summarize the information contained in the fifth annual report required by Section 309 of the Defense Production Act (DPA) and the National Defense Authorization Act of FY89 (NDAA89).<sup>9</sup> This report was prepared by a staff level interagency committee chaired by OMB and comprised of members from the Departments of Commerce, Defense, Labor, State and Treasury as well as the Arms Control and Disarmament Agency, the Central Intelligence Agency, the Federal Emergency Management Agency, the Council of Economic Advisers, the National Security Council, the United States Trade Representative and the Office of Management and Budget. This interagency committee adopted the informal title of coordinating committee and will be referred to as such in this chapter. The fifth annual report on offsets in military exports was selected because it is perhaps the most comprehensive macro report available on the issue of offsets and is the basis supporting many of the statements regarding their effects from the defense industry.

##### **A. BACKGROUND**

The database on offsets in military exports, developed for the purposes of the study, included not only the information they obtained in 1988 but also that compiled as a result of the 1985 study. Both databases were the result of information obtained from U.S. defense contractors solicited by government questionnaires. Due to some misgivings reported by GAO in their 1985 study, in June 1987, the coordinating committee began work on a new survey questionnaire. At a meeting of the Defense Industry Offset Association in October 1987, industry representatives were allowed to review and comment on the draft survey instrument. The final questionnaire was mailed to industry on August 23, 1988.

The survey requested information on military export sales contracts signed between

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<sup>9</sup>The majority of the information contained in this chapter is drawn from the 1990 OMB study on offsets in military exports. The source for the data presented is the OMB study unless otherwise noted.



January 1, 1980 and December 31, 1987, valued at over \$500,000 and that involved an offset agreement. The questionnaire was sent to 52 corporations selected by the coordinating committee from the top 100 DoD contractors.<sup>10</sup> Of the corporations solicited, 36 reported one or more qualifying contracts. In an effort to verify the accuracy and extent of the survey's coverage, the defense companies were also requested to provide information on all military export sales with or without offset obligations. This information was compared with data provided by the Arms Control and Disarmament Agency (ACDA) used in its annual World Military Expenditures and Arms Transfer report. Table 1 illustrates that approximately 93 percent of all U.S. military exports were accounted for by the survey.

Value of Military Export Agreements, 1980 - 1987 (Billions of Dollars)									
Source	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>Total</u>
ACDA	6.4	8.5	9.3	11.6	10.6	12.3	NA	NA	78.9
Survey	6.5	8.0	9.0	8.9	9.3	10.7	10.7	10.5	73.6
Survey % of ACDA	102	94	97	77	88	87	NA	NA	NA
NA - not available									
Source: OMB, Dec 1990									

Table 1

Given the high percentage of arms exports captured by the survey, the coordinating committee was confident that a similar if not higher percentage of offset agreements was also captured.

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<sup>10</sup> It is interesting to note that one of the GAO's misgivings concerning the 1985 offset study was that the subcontractors, who were most likely to feel the effects of offsets, were unrepresented. In the 1990 study this fact reappears and will be discussed in Chapter V.

## B. GENERAL SURVEY RESULTS

The results of their survey were a database that consisted of 336 separate sales and their associated offset obligations. For the 8 years covered by the survey, contracts with offset agreements totaled \$35.0 billion and involved 30 different countries or country groups. Three countries, Israel, Canada and Australia, along with the European Participating Group (EPG)<sup>11</sup> accounted for over half of the total value. The offset agreements associated with these contracts were valued at \$20.1 billion or 57 percent of the sales value.

Military Export Sales Contracts and Associated Offset Obligations by Country 1980 - 1987 (Millions of Dollars)			
<u>Country</u>	<u>Value of Export Sales Contracts</u>	<u>Value of Offset Obligations</u>	<u>Offset Obligations Percentage of Sales</u>
Australia	3,434.4	1,276.2	37.6
Belgium	389.1	336.3	86.4
Canada	3,890.1	3,035.1	78.0
Egypt	383.0	87.8	22.9
Euro Participating Group	5,219.0	2,209.9	42.3
Federal Republic Germany	1,328.8	792.3	59.6
Greece	850.2	332.0	39.1
Israel	6,095.0	1,399.4	23.0
NATO Group	667.4	320.4	48.0
Netherlands	821.8	512.6	62.4
Republic of Korea	1,056.8	488.0	46.2
Singapore	511.5	153.1	29.9
Spain	2,151.3	2,851.1	132.5
Sweden	381.7	667.7	174.9
Switzerland	370.9	248.5	67.0
Turkey	2,701.7	1,583.1	58.6
United Kingdom	1,878.2	2,014.7	107.3
All others	<u>2,842.8</u>	<u>1,775.7</u>	<u>62.5</u>
Totals	34,973.3	20,084.1	57.4
Source: OMB, 1990			

Table 2

<sup>11</sup>The European Participating Group is a consortium comprised of Belgium, Denmark, Norway and the Netherlands.

Table 2 above lists the countries that were the recipients of these sales contracts and the value of the offset agreement as a percentage. Once again Australia, Israel, Canada and the EPG, joined by Turkey and Spain, accounted for about 72 percent of the offset obligations.

The survey also used the Standard Industry Classification (SIC) system to collect information on the types of goods and services covered by the offset agreements. Table 3 provides the results of the offset obligations classified by SIC.

Value of Offset Obligation by SIC 1980 - 1987 (Millions of Dollars)		
<u>SIC</u> <u>Code</u>	<u>Industry Description</u>	<u>Value</u>
3679	Electronic Components	394.7
36xx	All other	<u>190.5</u>
36	Subtotal Electric and other Elctrc Eqpt	585.2
3721	Aircraft	709.0
3724	Aircraft Engines and Engine Parts	1,767.7
3728	Aircraft Parts and Equipment	4,391.7
37xx	All other	<u>103.9</u>
37	Subtotal Transportation Equipment	6,972.3
3812	Search and Navigation Equipment	1,998.6
38xx	All other	228.3
	Subtotal Instruments	2,226.9
	Other Manufacturing Industries	<u>345.7</u>
	Subtotal all Manufacturing	10,130.1
	Nonmanufacturing	73.9
	Not classified	<u>9,880.1</u>
	Total all offset products	20,084.1

Source: OMB, 1990

Table 3

The defense industry firms reported for approximately one half of the offset obligations, the types of goods and services were not determined at the time of the survey's distribution and consequently could not be classified. For the remaining offset obligations,

the vast majority was accounted for in manufactured goods, predominately aircraft engines and engine parts (SIC 3724), aircraft parts and equipment (SIC 3278) and radar and related navigational equipment (SIC 3812). The survey results were also categorized according to the type of offset and whether they were direct or indirect. Table 4 shows the value of the offset obligations according to this breakdown.

Value of Offset Obligations by Type of Offset 1980 - 1987 (Millions of Dollars)	
<u>Type of Offset</u>	<u>Obligations</u>
Direct Offsets	
Coproducton	3,093.9
Licensed Production	508.8
Subcontractor Production	3,412.3
Overseas Investment	30.1
Technology Transfer	149.7
Countertrade (Buybacks)	9.1
Not specified	<u>151.0</u>
Subtotal Direct Offsets	7,354.9
Indirect Offsets	
Coproducton	22.7
Licensed Production	70.0
Subcontractor Production	3,931.3
Overseas Investment	486.2
Technology Transfer	29.3
Countertrade (Buybacks)	1,533.4
Not specified	<u>2,284.8</u>
Subtotal Indirect Offsets	8,357.7
Not known offset	4,371.4
Total all types	20,084.1
Source: OMB, 1990	

Table 4

### **C. DEFENSE PREPAREDNESS AND INDUSTRIAL COMPETITIVENESS**

In their attempt to assess the impact offsets have in the area of defense preparedness and industrial competitiveness, the coordinating committee viewed both areas to have extensive overlap and combined their analysis.

A relevant measure of the impact of offsets on defense preparedness and industrial competitiveness have is the net economic benefits or costs derived from the military export sales that occur in the principal sectors of the economy that support the national defense. The coordinating committee defined the "defense sectors" as those sectors of the economy with 10 percent or more of the total 1987 output sold directly or indirectly for defense purposes.

To derive the net economic impacts of sales and their associated offsets, the Data Resources Incorporated (DRI) Interindustry Model of the United States economy was adopted by the coordinating committee. This model is based on the 1977 input-output table prepared by the Department of Commerce, with interindustry and final demand relationships updated through 1981. The model divides the economy into 425 sectors down to the four digit SIC level of detail. Through this model, it is possible to determine the direct and indirect impacts on output that a particular sale has on its own sector, as well as secondary or indirect impacts on output that a sale has on other sectors, (e.g., the impact an aircraft engine sale has on the aircraft engine sector as well as the semiconductor sector). These indirect impacts occur as direct impacts filter through the economy, affecting transaction flows among buying and selling industries. Industries that are not directly affected by sales and offsets may be indirectly affected by virtue of their position as suppliers to the industries that are being directly affected. The DRI model provides an estimate of the total impact on industrial output, which is the sum of both the direct and indirect impacts. (OMB, 1990)

The coordinating committee, using the DRI model and the data obtained from the 1988 survey, was able to calculate three sets of direct and indirect industry impacts.

1. Impacts resulting only from the actual billings of military export sales.
2. Impacts resulting only from the contribution of offset implementations tied to offset obligations.

3. Impacts resulting from the net effects of billings for military exports and their associated implement offsets.

Their analysis assumed that the impact of billings for military exports is always positive. In other words, billings always result in positive output for those industries affected. This approach assumes that for every billing in a given industrial sector, there was a corresponding increase in final demand that is met by output of a U.S. industry. They recognized that some of the output associated with a given billing may occur offshore, which tended to overstate the positive impacts of billings.

Offset implementations were interpreted as foregone production opportunities which resulted in negative output for those industries affected. This interpretation overstated the negative effects of offsets because not all offsets involve transfer of industry output to another country. This interpretation of the negative effects was viewed as having a balancing influence regarding their assumption on billings.

Defining a one percentage change in output as significant, the coordinating committee's analysis showed only four sectors experienced a significant net positive average annual impact on output and only one sector experienced a net negative average annual impact as a result of the direct effects of sales and offsets. Table 5 shows the cumulative effects on the top 25 defense sectors and non-defense sectors due to offsets.

The conclusions the coordinating committee drew from this data were that even under the assumptions that exaggerated the effects of billings and offsets, military exports and their associated offsets play only a minor role in terms of the overall output of defense and non-defense industries. Where they do have an effect, they generally result in net increases in output in the most technologically advanced sectors. In the Engineering and Scientific Instruments sector, which includes high technology fire control, search, navigation, guidance and other avionics systems used in aircraft, the survey reported a net average annual increase in output of 8.6 percent. By investing \$1.7 million in the form of offsets, U.S. industrial output in that sector benefitted by \$3.2 million.

Cumulative Direct and Indirect Effects of Sales and Offsets 1980-1987 on the Top 25  
Defense and Other Significantly Affected Industrial Sectors

Industry Title	Total Output Impact (Millions of 1989 Dollars)			Average Annual Output Impact		
	Net Effect	Sales Effect	Offset Effect	Net Effect	Sales Effect	Offset Effect
Eng & Scientific Inst	3,245	4,971	-1,726	8.6%	13.5%	-4.8%
Other Ordnance & Access	766	1,041	- 275	3.8%	5.2%	-1.4%
Aircraft	8,218	8,415	- 197	3.5%	3.6%	-0.1%
Aircraft Engines & Parts	2,697	4,495	-1,797	1.7%	2.9%	-1.2%
NonFer Forgings	104	189	- 85	0.9%	1.6%	-0.7%
Complete Guided Missiles	835	882	- 46	0.8%	0.9%	-0.0%
Radio & TV Comm Equip	2,202	2,809	- 607	0.4%	0.6%	-0.1%
Steam Engines & Turbines	149	193	- 44	0.4%	0.6%	-0.2%
Resistors	38	64	- 25	0.4%	0.7%	-0.3%
Tanks & Tank Components	163	178	- 15	0.4%	0.4%	-0.0%
Small Arms	30	49	- 19	0.4%	0.6%	-0.2%
Electronic Capacitors	47	78	- 31	0.4%	0.6%	-0.2%
Nonfer Castings	38	78	- 40	0.3%	0.6%	-0.3%
Ammunition	61	70	- 9	0.2%	0.2%	-0.0%
Iron & Steel Forgings	53	164	- 111	0.2%	0.6%	-0.4%
Elec Measuring Instr	108	205	- 96	0.2%	0.3%	-0.1%
Optical Instr & Lenses	59	118	- 59	0.1%	0.2%	-0.1%
Primary Nonfer Metals	11	90	- 79	0.1%	0.5%	-0.4%
Other Business Services	96	234	- 138	0.0%	0.0%	-0.0%
Explosives	.4	5	- 5	0.0%	0.1%	-0.1%
Maint and Repair, Public	4	13	- 9	0.0%	0.0%	-0.0%
Industrial Trucks & Tractors	-2	2	- 4	0.0%	0.0%	-0.0%
Ammunition Small Arms	-1	0	- 1	0.0%	0.0%	-0.0%
Elec Equip	2	39	- 37	0.0%	0.3%	-0.3%
Machine Tools, Metal	-6	8	- 14	-0.1%	0.1%	-0.2%
Surgical & Medical Instr	-33	0	- 33	-0.1%	0.0%	-0.1%
Shipbuilding & Repairing	-68	1	- 69	-0.1%	0.0%	-0.1%
Measuring & Control Inst	-135	132	- 267	-0.1%	0.1%	-0.2%
Machine Tools, Cutting	-40	31	- 71	-0.2%	0.1%	-0.3%
Footwear, Cut Stock	-15	0	- 15	-0.9%	0.0%	-0.9%
Aircraft Parts & Equip	-2,088	2,683	- 4,772	-1.2%	1.5%	-2.7%

Source: OMB, 1990

Table 5

In contrast, the only defense related sector that experienced a net negative annual effect, Aircraft Parts and Equipment, was a sector of the aerospace industry where foreign competition was already strongest. The coordinating committee's views were supported by a Department of Commerce's publication which stated:

Foreign competition is gaining intensity in the aircraft parts sector, as more countries gain experience in the manufacture of aircraft parts through licensed and shared production agreements. During sales negotiations, U.S. aircraft manufacturers are under considerable pressure from foreign countries to make production-sharing agreements. Imports of aircraft parts have more than doubled since 1982, climbing from \$1.6 billion to about \$3.4 billion in 1988. Canada, France and the United Kingdom are the largest foreign suppliers of aircraft parts to the U.S. market, but imports from developing countries, such as China, South Korea and Taiwan are increasing at a rapid rate. (DoC, 1989)

The results of the offset study seem to be consistent with the notion that offset implementations flow through the path of least resistance. Companies tend to implement their offset requirements in those areas where foreign capabilities already exist. Where offset implementations are defense related, they often take place in the large, but less technologically important sectors, where there is already a substantial and growing foreign capability. When offsets implementations are not defense related they are generally distributed in sectors that reflect the existing industrial strengths of the purchasing country, reinforcing the status quo. (OMB, 1990)

#### **D. OFFSET IMPACT ON EMPLOYMENT**

The coordinating committee's analysis of the employment effects due to offsets provided less succinct conclusions than their results concerning defense preparedness or industrial competitiveness. The weakness in their conclusions stemmed from the methodology they used to collect the data necessary from which to draw them.

The coordinating committee's approach in its evaluation of offset effects on employment was derived from the prime contractors' estimates of the employment effects of



a particular sale and the employment effects determined by means of the input-output table and output-labor ratios of the U.S. economy.

The prime contractors' estimates included only the direct employment effects within their facilities and not indirect effects on secondary or lower tier subcontractors. In order to estimate these effects, the coordinating committee turned to the input-output (I-O) table. The I-O table, with the aid of output-labor ratios, indicated that the indirect employment effects are likely to be greater than the direct effects, however the effectiveness of their evaluation of the employment question was hampered by the assumption that the prime contractors' estimates were presented in a light that was favorable for their purposes, and not necessarily a true representation of the employment effects. (OMB, 1990)

Another major deficiency was highlighted by the Director of the Bureau of Economic Analysis. In his February 28, 1989 memorandum he stated that the prime's used a variety of methods to estimate the offset effects on employment to include the following:

- 1) There would have been no sale without the offsets; therefore, there was an employee gain equal to that involved in the work done under the contract.
- 2) Cannot derive a number directly, so used the product of the \$/employee year estimate and the value of the implementation.
- 3) Guessed at what employment the foreign firm gained in producing the offset implementation.
- 4) Made the answer zero because it was very small or could not make a rational guess. (BEA, 1989)

This problem occurred in both large and small companies. Solutions, such as recontacting the companies and having them re-estimate the data using some consistent methodology, would have been very expensive and time consuming. A supplemental survey, focusing only on this question, also would have required considerable resources.

The coordinating committee adopted method (b) presented in the BEA memorandum. Their method used the output-labor ratio, as estimated by the prime contractors, to derive the

estimates of the direct employment effects of offsets. Since the primes' responses probably overestimated the direct employment effects of the sales, this method tended to overestimate the adverse direct employment effects of offsets.

Their method also overestimated the adverse employment effects because it assumed that all offset implementation reduced domestic production and, therefore, employment. They point out that \$500 million of the offset implementations were assumed by the prime's offshore subcontractor and another \$238 million taken on by foreign sub-contractors. Since both of these groups of establishments are likely to replace foreign rather than domestic production, they are unlikely to generate adverse domestic employment effects. While the coordinating committee did include these employment effects in their results, their assumptions were predicated on the foundation that there were no domestic sub-contractors to perform this work, or in the absence of the offset agreements, the work would have gone to these groups regardless.

In assessing the indirect employment effects, the coordinating committee turned once again to the I-O table for the U.S. economy. To derive the number of employee years required to produce the output changes associated with the U.S. foreign military sales, the coordinating committee calculated a ratio of the direct employment effects reported by the primes to the direct employment effects derived with the aid of the labor/output ratios and the I-O table. This ratio is then used to adjust downward the effects of the sales.

Given the information and tools they had available, the coordinating committee made an attempt to quantify the indirect employment effects. However, certain assumptions and the accuracy of the data received from the prime's once again affected their results. The I-O table used was, admittedly, out of date and ignored the relationships of changes in relative prices over time and the response to technological change. As wages increase over time, and technology allows producer's to build weapons systems cheaper with less manpower, the resulting indirect employment effects are likely a worse case projection. The I-O table does not recognize the existence of economies of scale. Assuming that most foreign military sales are extensions of U.S. military service's contracts, and merely lengthen the production runs,

this omission is likely to have severe effects in the case of predicting indirect employment effects of both the sales and the offsets.

In general their analysis showed that offsets have little effect on overall U.S. employment. Military sales abroad that contractually require offsets are likely to have a net increase in domestic employment of 2,500 employee years per year. They admit that specific contractors or subcontractors may suffer declines in domestic employment due to offset agreements; however, these declines are likely to be countered by equal or greater employment gains in other sectors of the U.S. economy. (OMB, 1990)

The offset effects redistribute employment across U.S. industries. They induce shifts in employment to industries where the U.S. has a comparative advantage from industries that have a significant foreign presence or dominance. They do not say with certainty that there is no loss in total employment in certain industrial sectors due to offsets but emphasize the redistributed effects that reinforce the status quo.

For the period 1980 - 1987, domestic production of the military goods sold required 110,000 employee-years of labor. Their figures showed that about 50 percent of these gains occurred in two industrial sectors, aircraft and aircraft and missile engines, two areas where the U.S. has a commanding lead over other foreign competitors. Their figures also indicated that offset implementations effect a broader range of sectors than do the actual sales, in many cases adversely affecting many industries that do not benefit directly from sales. In the case of the aircraft sector, which accounts for 45 percent of all sales, they accounted for only 2 percent of the offset implementations. This is indicative of the trend that the effects of offsets fall disproportionately on industries other than those that generate the sales.

## **E. OFFSET IMPACT ON TRADE**

The coordinating committee's analysis of the impact offsets have on the trade of the U.S. was focused on the distribution of sales and offset obligations by recipient country and by sector. Their analysis, however, was challenged by the fact that at the time of the survey many of the primes did not know the product sectors in which the offset concessions would occur. When the product involved was known, the trade consequences were often

ambiguous. In the case of countertrade, technology transfer or investment, the trade consequences are not readily identifiable and are likely to occur beyond the short term.

Given the limitations with the survey data, the coordinating committee organized the offset obligations into three categories.

1. Offsets agreements assumed to increase U.S. imports. (i.e., countertrade)
2. Offset agreements assumed to reduce the level of U.S. exports. (i.e., coproduction, subcontracting and licensed production)
3. Offset agreements whose trade effects are ambiguous or undetermined. (i.e., direct investment, technology transfer and those not known by primes)

Their analysis concluded that the effect on U.S. trade of transactions reported in the survey was positive. The total billings of \$19.8 billion in 1980-1987 compared to total offset implementations for that period of \$10.7 billion. (OMB, 1990)

The sectoral effects were evaluated by segregating the offset agreements according to the sector they affected and comparing them with their respective billings. Table 6 shows the net effects of billings and offset implementations in the 1980-1987 period.

The net effect of the offset agreements was strongly positive for most aerospace industries such as aircraft, radars and aircraft engines. These industries reaped substantial net benefits, even though the offset implementations they provided were in themselves significant. Additionally, smaller positive effects occurred in non-aerospace industries such as Communications Equipment and Engines and Turbines.

All the news, however, was not good. In the aircraft parts, electronic components, basic steel and industrial machinery sectors, the net trade effects were negative.

Major Sectoral Effect, 1980-1987  
Total Billings and Offset Implementations  
(Millions of Dollars)

Sector	Billings	Offset	Net Effect
Aircraft	8907.6	210.0	8,697.6
Search/Navigation Equip	4059.2	1,531.3	2,527.9
Aircraft Engines/Parts	3350.5	1,402.0	1,948.5
Communications Equip	841.5	102.7	738.8
Guided Missile/Space Veh	817.4	43.8	773.6
Ordnance & Accessories	718.7	195.4	523.3
Motor Vehicles & Equip	515.3	95.4	419.9
Aircraft Parts	223.0	3,792.7	-3,569.7
Engines & Turbines	191.3	61.3	130.0
Tanks & Components	41.9	0.0	41.9
Computer & Office Equip	35.9	54.3	- 18.4
Elect Components & Acces	26.1	490.6	- 464.5
Basic Steel Products	0.0	195.4	- 195.4
Industrial Machinery	0.0	137.6	- 137.6

Source: OMB 1990

Table 6

The findings on how offsets effect trade are consistent with the coordinating committee's previous findings on defense preparedness, industrial competitiveness and employment. The sectors that experienced a negative effect due to offsets are those where a significant foreign presence exists and U.S. firms are at a comparative disadvantage.

The coordinating committee also organized their information in an attempt to shed further light on who was receiving offset concessions relative to their research and development (R&D) resources as classified by the Organization of Economic Cooperation and Development (OECD). The OECD classifies its member countries as either high, medium or low R&D countries, depending on the amount of funding and number of technical personnel they devote to R&D activities. A number of developing countries were also

prevalent in the survey results and the OECD classification was augmented by groupings of LDCs. The LDCs were divided into two groups. One group consisted of those LDCs having a 1988 per capita GNP of over \$2,000 and the remaining group consisted of those with a 1988 per capita GNP of below \$1,000. These groups were designated the High Income and Low Income LDCs.

Table 7 shows the breakdown of where a particular country fell in relation to the OECD and LDC classification and Table 8 shows the offset distribution.

Country Categories				
<u>OECD High</u>	<u>OECD Medium</u>	<u>OECD Low</u>	<u>LDC High</u>	<u>LDC Low</u>
France	Australia	Denmark	Brazil	China
Germany	Belgium	Greece	Israel	Egypt
U.K.	Canada	Luxembourg	Korea	Indonesia
NATO	Italy	New Zealand	Saudi Arabia	Philippines
	Netherlands	Norway	Singapore	
	Sweden	Portugal		
	Switzerland	Spain		
	EPG	Turkey		
		Yugoslavia		
Source: OMB, 1990				

Table 7

Distribution of Offsets by Country and Offset Category 1980-1987 (Millions of Dollars)					
	OECD HIGH	OECD MED	OECD LOW	LDC HIGH	LDC LOW
Expanded Imports	1,426.5	990.3	267.8	363.2	23.4
Reduced Imports	957.2	3,476.0	345.7	828.3	13.3
Ambiguous	<u>107.5</u>	<u>481.1</u>	<u>459.7</u>	<u>940.7</u>	<u>8.4</u>
Totals	2,491.2	4,957.4	1,073.2	2132.2	45.1
Source: OMB, 1990					

Table 8

Table 7 and 8 both illustrate that offsets benefit mainly the OECD high and medium countries, who received 70 percent of the total offset value. The next greatest concentration is in the LDC High countries, which include Israel and Korea. When added to the previous group, these three groups account for over 90 percent of the dollar value of offsets reported by the survey.

For the offset category "Expanded Imports", the highest three categories are again OECD High, Medium and LDC High countries. This offset category included countertrade that normally comes in the form of indirect offsets, offsets that are not associated with the military article being purchased. This category is attractive to these country groups because it allows them to take advantage of selling products they are already competitive in, increasing their markets.

For offset category "Reduced Imports", once again includes the countries contained in the OECD High, Medium and LDC high classifications. This category includes coproduction, subcontracting or licensed production types of offsets. These countries are capitalizing on existing domestic industrial capacity with the aim of enlarging or fully employing existing industries. The coordinating committee concluded this to be the case and discounted the notion that these countries were attempting to create a new industry.

The final offset category, "Ambiguous", is perhaps the one of greatest concern, in that its consequences are not known. Most often associated with technology transfer and direct investment, the ramifications of such actions cannot be determined in the near-term. This category also includes offset agreements that were unknown at the time of the survey, again limiting the conclusions that can be drawn. Given that over 47 percent of the total offset value is held by LDC High countries, a general conclusion that these countries are attempting to acquire the technology and "know-how" to improve their own self-sufficiency can be made. The consequences of this particular category are likely to be realized in the future and would warrant further attention and evaluation.

## **F. SUMMARY**

The coordinating committee's conclusions contained in the OMB 1990 report generally state that while offsets are an aberration of the free market mechanism, they are generally favorable or at least neutral in their effects on the U.S. From their macroeconomic evaluations in the areas of defense preparedness, industrial competitiveness, employment and trade, they have concluded that on a whole the U.S. comes out ahead. They recognize that certain sectors of the U.S. industry do in fact suffer negative effects from offsets, but these are countered when the positive and negative effects are aggregated.

The significance of the coordinating committee's 1990 study of the effects offset agreements have on the U.S. is that it is perhaps the most comprehensive macro study conducted by any private or public organization. For this reason, this chapter has been devoted to the description and findings of their analysis. Their analysis and findings will help illustrate, in Chapter V, how offset agreements are a facet of the globalization of the world's economies, the potential consequences of this trend to the U.S. and how the U.S. can adapt to this new world order.





## **V. OFFSET AGREEMENTS AND THE GLOBALIZATION OF DEFENSE PRODUCTION**

Chapter V will analyze the macro effects of offset agreements on the U.S. and discuss how offset agreements of the past have contributed to the globalization of the U.S. arms industry.

### **A. GENERAL**

The OMB chaired coordinating committee's analysis of the effects offset agreements have on the U.S. was very ambitious and difficult due to the range of factors involved. To accurately determine how an offset agreement will impact defense let alone non-defense industry sectors in regards to employment would require tracking individual offset agreements from their inception down to each industry sector affected. With the limitations of time and funds available, such an endeavor was not possible and led to the adoption of a macro approach as opposed to a micro one. Their subsequent analysis and report provides a very accurate picture of the overall impact of offsets on the U.S. in the areas of defense preparedness and defense industrial competitiveness, but is less succinct in the area of employment. This shortcoming is due to the limitations associated with the macro approach. To adequately determine the effects on unemployment, a much more detailed database would have been required, with subcontractors, representative of the lower tier producers, surveyed. This approach also has its faults in that it will provide an accurate picture of direct offset effects, however; indirect effects will remain an estimate at best.

The 1990 OMB report on the effects of offsets noted that the implementation of offset agreements tends to take the least path of resistance. (OMB, 1990) Foreign buyers who require offsets as a condition of sale are concerned with enhancing their existing domestic capabilities. Consequently offsets have their greatest effects in sectors where the presence of foreign competitors is significant or dominant. This indicates that offset agreements do not necessarily disrupt the equilibrium between the world's economies but rather reinforces this status quo.

This equilibrium is not the previous situation of a wholly indigenous armaments

production, but rather entails a significant shift away toward internationalization. Multinational arms production, through collaboration on individual weapons systems between countries or via interfirm relationships across the international arms industry, seems to be expanding (Bitzinger, 1994). This emergence of transnational arms production is reshaping much of the international arms industry and will require the U.S. Government to rethink its trade policies in light of the globalization trend.

This chapter will analyze the globalization trend and depict the role offset agreements have had in reinforcing this new configuration.

## **B. OFFSETS AND GLOBALIZATION**

It is interesting to note that much of the globalization that has occurred since the mid 1980s has been due in part to the cooperation and offsets provided by the U.S. We are reaping what we have sown.

U.S. assistance to Europe following World War II, helping them recover economically and militarily, has led to their emergence as a significant force within the arms market. Sharing a common goal of defending against Soviet aggression and expansion, interoperability between NATO forces was of particular concern. U.S. motivation for such cooperation emphasized the military advantage of NATO. In Washington's eyes, by eliminating duplication and competition in the development, production and procurement of weapon systems, NATO would not only be more capable but more efficient as well, saving money while fielding a more effective force (Webb, 1992). This viewpoint was predicated on the notion that the duplication and competition to be eliminated was on the other side of the Atlantic since the U.S. was already developing American weapons systems for U.S. forces and represented the latest in military technology. The European members of NATO focused on the economic and political importance. West European governments stressed the benefits of jobs, the development of their high-tech R&D bases, and export sales arising from armaments production (Bitzinger, 1994).

This divergence of viewpoints became the basis for the increase in offset requirements for U.S. systems not only among NATO member countries but also Canada, Australia, Japan

and many countries in the Third World who also entertain notions of building their own defense industrial capabilities.

As one examines this restructuring and the associated industrial activities involved, the range includes such items as technology transfers, international subcontracting, licensed production, co-development and co-production of major weapon systems; the same types of activities popular among countries requiring offset agreements. The growth of offset agreements in the early to mid 1980s also coincides with the globalization trend.

With this restructuring comes a new lexicon of terms, listed in Table 1, which are familiar to the commercial sector, but potentially may carry serious consequences for the arms market. The globalization of arms production began with international cooperation among the countries of the NATO alliance, characterized by offset agreements between the participating countries. Between 1950 and 1960 the U.S. was the dominant supplier of licenses to produce U.S. weapons systems to NATO countries. The adoption of the Eisenhower Doctrine, Kennedy's Alliance for Progress and the Nixon Doctrine expanded the number of recipients of U.S. offset agreements in the form of production licenses to include countries in the Middle East and Asia (Bitzinger, 1994). The United States during this period licensed the production of the F-104 fighter jet to Germany, Belgium, the Netherlands, Italy and Japan, the M-60 tank to Italy and the Sidewinder missile to Japan, Taiwan and several NATO countries (Bitzinger, 1994). During this same time period, licenses granted by other countries were also on the rise. Western European countries granted licenses to countries in Latin America, Southeast Asia and the Middle East. India worked both sides of the Iron Curtain, producing both French helicopters and Soviet missiles.

Licensed production was a means by which the recipient country could develop its own capability for arms production; however it was not without its drawbacks. Licensed production is essentially a one-way street. The recipient remains dependent on the supplier for the technology and remains to some extent a captive audience; a client state of sort, subject to the whims and generosity of the providing country. While the weapon system that is licensed is likely a mature and capable system, it is also likely to be obsolete given the rapid

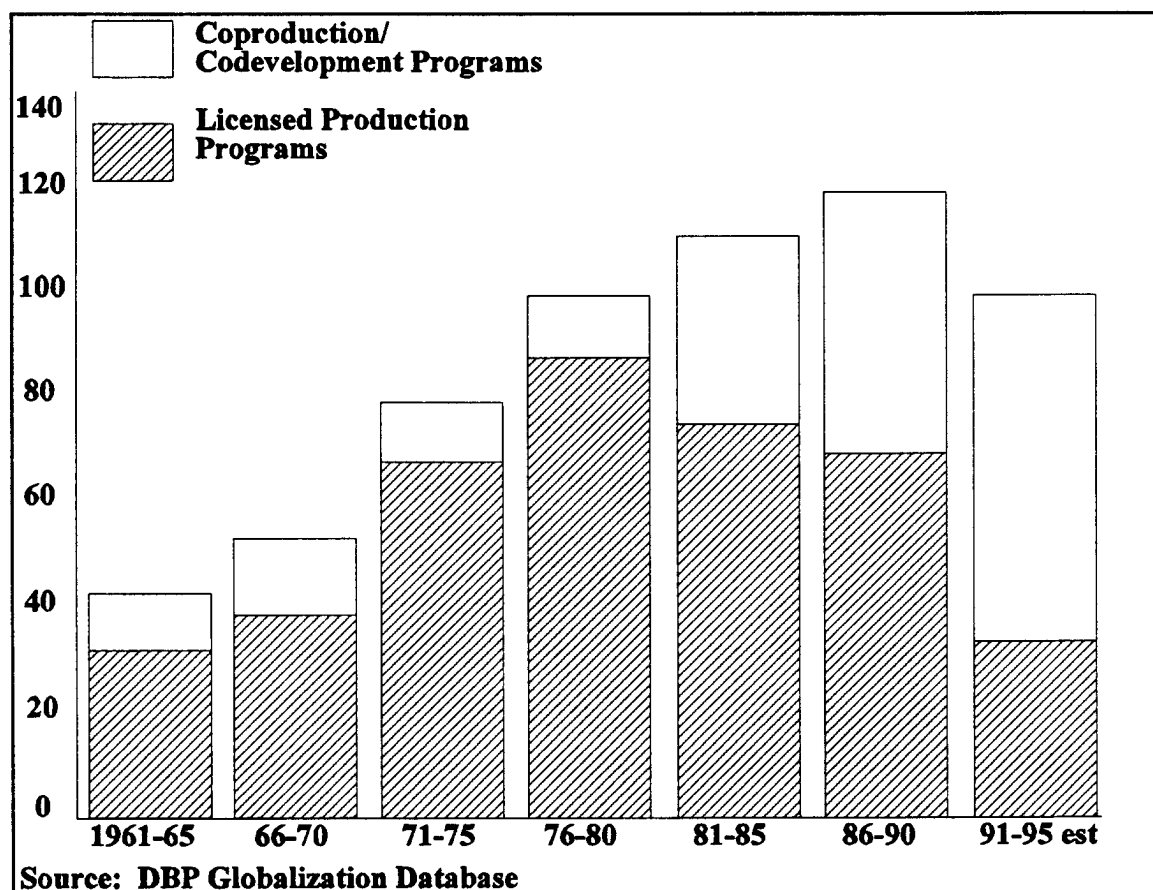
technological advances made during that period.

From the perspective of the supplying country, they bear the costs and risks of developing these new weapon systems that are not compensated by the licensing process.

Table 1

GLOBALIZATION OF ARMS PRODUCTION: DEFINITION OF TERMS	
Co-development:	The transnational design, development and production of a weapon system.
Collaboration:	The international coproduction or co-development of a weapon system.
Consortium/Consortia:	A formal but ad hoc industrial arrangement to co-develop or co-produce a single weapon system.
Family of Weapons:	An international division of labor involving several related weapons systems, whereby participating countries separately develop a particular weapon within the group and then permit the other participants to produce that weapon for themselves.
Government-led Initiative:	Globalization projects or activities initiated by government entities.
Industry-led Initiative:	Globalization projects or activities initiated by defense firms.
Joint Venture:	An international company jointly owned and operated by defense firms in two or more countries in order to co-develop or co-produce a particular weapon or class of weapons.
Licensed Production:	The transnational sale of the rights to manufacture a weapon system originally developed within the supplier country.
Mergers and Acquisitions:	The purchase of shares in a defense firm by a defense company in another country, up to gaining majority control in that firm.
Strategic Alliance:	A loose industrial arrangement between defense firms in two or more countries to study or plan future possible co-production or co-development.
Source: Bitzinger, 1994	

Even though licensed production remains a major mode of armaments production today, accounting for over \$528 million dollars in offset agreements (OMB, 1990), the desire



**Figure 1 International Arms Cooperation 1961 - 1995**

to create a two-way street, where arms producing countries could share the costs and risks of weapons development and manufacture has become more popular. Figure 1 illustrates how the form of international arms cooperation has changed over the past 35 years from one dominated by licensed production to today's environment where codevelopment/coproduction make up the majority of the programs. Offset agreements associated with this type of

cooperation accounted for over \$6.6 billion during the 1980-87 timeframe (OMB, 1990).<sup>12</sup>

The catalyst that initiated the increase in cooperation between allies and friendly nations was the emergence of the Soviet Union as a superpower following World War II and the NATO alliance that emerged to combat that threat. Increasingly, NATO countries invested in their own indigenous arms production capabilities; however, rationalization, standardization and interoperability (RSI) requirements between their systems and their allies increased the number of cooperative programs. Ironically, it was the fall of the Soviet Union and the dissolution of the Warsaw Pact that provided the next push towards the global economic integration of the arms market.

The end of the Cold War led many governments to make substantial cuts in their defense spending. Coupled with the increasing research and development and production costs associated with the next generation weapon systems this has resulted in fewer new weapon systems being developed and existing systems procured in smaller numbers. As U.S. defense industries are confronted with a shrinking defense market and excess production capacity, they are looking for customers abroad. DoD is unable to fully support the U.S. defense industrial complex and exports are expected to account for about 25 percent of the defense contractors' revenue in the future (Vartabedian and Broder, 15 Nov 1994).

Defense firms, both in the U.S. and abroad, have been aggressively pursuing overseas arms sales. In 1992, U.S. arms producers sold over \$28 billion worth of military equipment, compared to \$12 billion in 1991. In 1993, U.S. arms sales amounted to \$32 billion. (Vartabein and Marshall, 1993)

While no government figures are available that account for the value of the associated offset agreements, past experience leads to the conclusion that they were required. The sale of F-16s and Bradley Fighting Vehicles to Turkey in 1992 required Lockheed Fort Worth and FMC to produce portions of these weapon systems in Turkey (McHenry, 1994).

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<sup>12</sup>The OMB 1990 report subdivided coproduction offset agreements into both coproduction and subcontractor production categories which accounted for \$3.2 and \$3.4 billion in offset obligations for the 1980-87 time period. Coproduction tends to be at the system integrator level, while subcontractor production occurs at lower production tiers.

To illustrate how offset agreements contribute to the globalization of the arms market two major sales are discussed.

### 1. Patriot Missile System

In 1984, the U.S. Secretary of Defense and the Federal Republic of Germany's Minister of Defense signed an agreement implementing cooperative measures for improving air defense in Central Europe. As part of this agreement, Germany agreed to purchase through foreign military sales 14 Patriot fire units from the U.S. Government for \$872 million dollars (OMB, 1989).

A critical aspect in concluding this agreement was a separate arrangement, according to which the U.S. Raytheon Corporation agreed to provide German industry with \$500 million in offsets for contracts to manufacture Patriot components and spare parts and for logistical services (OMB, 1989). Five firms in Germany were licensed to produce major

Table 2

PATRIOT SUBCONTRACTOR PRODUCTION AGREEMENT			
German Firm	U.S. Licensor	Component	Quantity
MBB	Morton Thiokol	Rocket Motor	1,980
MBB	Martin Marietta	Propulsion Section	1,980
MBB	Raytheon and Martin Marietta	Missile Round Assy	1,980
MBB	N/A	Safety and Arming Devices & Warheads	1,680
MBB	Martin Marietta	Control Section Assy	840
AEG	Raytheon	Travelling Wave Tubes	1,680
Siemens	Raytheon	Displays & Controls	36
		IFF Antennas	37
Diehl	Eagle Picher	Batteries	1,680
Diehl	Raytheon	Electric Modules	10,316
Motorenwerk Bremerhaven	Raytheon	Cables	16,416
Source: OMB, 1989			



subsystems for the Patriot system that accounted for over \$300 million of the offset package, with the German contractor, Messerschmitt, Boelkow and Blohm (MBB) accounting for two thirds of this production. Table 2 provides a list of the German firms that participated along with the components they built.

The Patriot sale to Germany is a case of an international arms sale where the foreign policy considerations and military operational requirements outweigh the consequences associated with trade balance and industrial competitiveness.

U.S. industry benefitted from the sale of the Patriot fire units. However, the direct offsets in the form of coproduction, subcontracting and technology transfer will likely contribute to the capabilities of German industry.

The U.S. contractor whose parts and components are now being produced by a German firm will likely face increased competition in bidding and being subcontracted on future Patriot orders. From the perspective of Raytheon, with the objective of securing additional foreign sales, having a German subcontractor could be a major selling point when selling their system to other Western European countries.

A sale between the U.S. and the Netherlands for the Patriot system had similar characteristics and consequences similar to sale to Germany. In the Netherlands case, the offset value of \$305 million was equal to the purchase price (OMB, 1990). The Netherlands company Fokker aircraft was licensed to produce electronic circuit boards and power supplies, and duplicated Raytheon's special factory test equipment. Additionally the U.S. agreed to buy \$70 million worth of Patriot missile canisters produced in the Netherlands.

In the Netherlands case, U.S. "know-how" and technology was transferred to the Netherlands and will likely increase competition within those defense industry sectors. The level of competition could also increase if the transferred technology has dual-use applications, causing it to ripple through commercial industry sectors as well.

## **2. AWACS**

The sale of Airborne Warning and Control System (AWACS) aircraft to Britain in 1987 involved offsets of 130 percent of the contract value. Given the fact that Britain is a major arms producer in its own right, this agreement warrants further analysis.

In December of 1986, the British Ministry of Defence announced the selection of the Boeing AWACS as the system to satisfy their country's airborne early warning requirement. This decision was preceded by competition between U.S. and U.K. defense corporations which opened in the summer of 1986. The initial competition included seven companies submitting bids, but was dominated by the U.S. Boeing Corporation's AWACS and GEC's Nimrod AEW.3. Boeing's opening bid included 35 percent of the contract value in offset concessions, which increased to 100 percent a month later, which is the normal minimum acceptable to the British Government.

In September of that year, Boeing and Nimrod were selected as the finalists in the competition, shortly thereafter, Boeing increased its offset offer to 130 percent of the contract value. During this same time period Boeing had negotiated participation agreements with three British avionics firms, Plessey, Ferranti and Racal, who in turn publicly supported AWACS over the Nimrod system. These firms were not participants in the Nimrod program. The agreements simply stated the intent to cooperate should the AWACS be selected. The fact that the three British firms party to this agreement were the largest aerospace-related firms in Britain played an important role in making the American buy seem less onerous to the members of the Defence Ministry.

The selection of the Boeing AWACS to fulfill the British Government's airborne early warning requirement was met with public outrage originating from GEC, the maker of the Nimrod. The loss of jobs in the British electronic industry was estimated at 2,500. However, the British Minister of Defence, George Younger, stated that the gains to other British firms would equal or exceed the losses to GEC.

The formal agreement between Britain and Boeing included only 5 percent of the 130 as directly associated with the AWACS program. The remaining 125 percent were indirect, associated with high technology defense and aerospace product areas. Additionally awards

to British firms in future Boeing contracts would be counted toward the offset, effectively providing an incentive for Boeing to look "more favorably" on British firms that were as competitive as U.S. or other firms for future contracts.

The objectives of the British offset program, to facilitate the development of "high technology" in the UK defense and aerospace industry, were achieved with the AWACS purchase. Plessey, the British aerospace firm that supported the AWACS buy, has teamed with Boeing in bidding for the Iceland Air Defense System being procured by NATO. Additionally, Plessey is cooperating with Boeing and Westinghouse, the manufacturer of the surveillance radar system in the AWACS, in other areas to include advanced air-based and land-based radars, advanced technical research and future development of airborne early warning system modifications and improvements.

Other areas under consideration for Westinghouse/Plessey offset cooperation include Ballistic Missile Defense research programs, fiber optics technology and sensor systems technology.

The sale of the AWACS as well as the Patriot sale to Germany and the Netherlands illustrate how the U.S. has aided its allies and friends in developing their domestic industrial capabilities in defense and non-defense sectors. The sharing of a common objective to provide security to the European continent superseded the consequences of the offset to the U.S. industrial base. In the case of the AWACS sale, it is very evident that the 130 percent offset agreement played a major role in the selection. Given the environment at the time, with the Cold War ongoing and arms sales relatively high compared with today, having the increased competition was not particularly threatening to the U.S. industrial competitiveness.

Extending those concessions into the present, with arms sales dropping significantly, the assistance the U.S. provided to its allies and friends in the past could have significant consequences in the future. The threat is not at the system level, where the U.S. remains the leader, but rather at the component and subassembly level where many of the offset agreements have been focused. The threat is not that another country will develop a fighter or main battle tank that can compete with a U.S. design, but rather that the wings for that

fighter or components for the tank may be dominated by a foreign manufacturer, whose initial start in that sector was provided by offset agreements in the past. Foreign subcontractors could also be the firm of choice for U.S. defense producers where existing offset obligations can be met through their use or in circumstances where having a foreign subcontractor is politically to their benefit when selling their arms abroad.

These implications are the concern for the future and the symptoms of the globalization trend. To remain competitive for a bid, a U.S. firm must offer offsets to the foreign buyer. To remain competitive and solvent in the long term, the same U.S. firm must rely more heavily on export sales and establish long term relationships with foreign contractors or subcontractors.

### **C. SIGNIFICANCE OF GLOBALIZATION**

The globalization of the world's economies for commercial or non-defense products is not a new phenomenon. As the nations of the world shifted from an agrarian culture to an industrialized one, each nation became somewhat dependent on others due to scarcity of natural resources. As technology improved the sophistication of the tools and products used, each nation tended to specialize in high technology or labor intensive markets. Each nation relied upon the other to provide the goods and services it lacked. High tech countries exported labor intensive production to the nations that specialized in such skills, while the nations that specialized in labor markets imported the high tech goods. The nations of the world, either by design or by circumstance, established a niche for themselves within the world market place.

This same phenomenon appears to be happening within the world's arm market. No nation is entirely self-sufficient in arms production, but to some degree relies upon other nations to produce or acquire arms. This new development in the global arms industry started in the mid to late 1980s as international takeovers and joint ventures restructured the international arms market. The U.S. has participated in transnational development and production of weapon systems, most notably the F-16 upgrade with a European consortium and the AV-8B Harrier II codevelopment/coproduction program with the U.K.. However,

much of the cooperation has occurred in Western Europe. Table 3 lists the number of joint ventures, strategic alliances and mergers and acquisitions that have occurred in the 1961-1993 timeframe.

The more recent defense-related joint ventures and mergers and acquisitions have taken place predominately in Western Europe, supplanting existing national defense industries with regional alliances. The strategy involved in these crossborder mergers/collaboration involved not only sharing the risks associated with new weapons development and production, but also access to foreign technologies, markets and achieving economies of scales in arms production quicker with the greater demand.

Table 3

The Globalization of the Defense Industry, 1961-93			
	Joint Ventures	Strategic Alliances	Mergers & Acquisitions
1961-65	-	-	-
1966-70	-	-	1
1971-75	2	-	1
1976-80	1	-	-
1981-85	1	-	1
1986-90	11	7	55
1991-93	16	16	23
Source: DBP Globalization Database			

This regional consolidation in Western Europe, combined with the potential for the political integration and emergence of a Western Europe self-identity may play a major role in the success of future U.S. arms sales in this region. The arms market, long dominated by the U.S., will likely include a pan-European arms industry, where the U.S. is considered a competitor vice a partner in arms development and production. Western European defense

cooperation will likely include a "European preference" in military procurement at the expense

of U.S. arms. France's criticism of Greece and Switzerland for buying U.S. rather than European-built fighter jets is a possible example of the protectionism that may be prevalent in the future (Briganti and Silverberg, 1993). U.S. defense firms may find themselves frozen out of the Western European arms market, unable to do business with Britain and Germany in the fashion they have in the past.

The viability of the U.S. arms industry, given the downward spiralling domestic sales, will increasingly depend on cooperation between U.S. and foreign firms. This cooperation will come in the form of offset agreements to include coproduction/development of weapon systems and foreign subcontracting of major components. This cooperation will not be of a fleeting nature but more qualitative. Ad hoc cooperation will be replaced by more sophisticated, complex and permanent relationships, accelerating globalization of the defense industries, where no nation will be able to pay the price associated with an independent, wholly indigenous defense industrial base.

The attitude of the U.S. Government regarding the more qualitative nature of this cooperation has been extremely critical when confronted with foreign purchase of U.S. defense corporations. The attempted acquisition of Loral Vought by Matra of France was met by strong opposition within Congress, which took the view that foreign ownership or control of U.S. defense corporations undermined our indigenous arms capabilities and national security. But the acquisition of Fairchild Defense Systems, a U.S. aerospace firm by the same Matra and the pending sale of the U.S. based Allison Engine Company, maker of the engines for the C-130 transport aircraft, V-22 Tiltrotor and the RAH-66 Comanche helicopter, to the British firm Rolls Royce may indicate a softening of congressional concern and recognition of globalization in the arms industry. Such a move would give Rolls Royce a potential foothold in the U.S. military and commercial engine market. In addition to forming a link between the U.S. and Europe on programs such as the V-22 tiltrotor and the C-130J transport aircraft, if these systems are released for overseas sale, a key selling point could be that the engines, made by Allison, are part of a European defense firm.

Much of the U.S. response to globalization and the reduction in domestic defense

spending has been the internal restructuring of the U.S. defense industry. Notable mergers such as Martin Marietta with Lockheed are designed to strengthen their positions in niche markets. This merger is anticipated to control 32 percent of the tactical aircraft market, due to the strength of Lockheed Corporation's aircraft programs, including the F-22, F-16 and F-117, along with the C-130 transport aircraft. Lockheed Martin, as it is now called, would also supply 52 percent of the launch services by Western companies, crossing into non-defense aerospace and space systems markets. (Finnegan, 1994)

Martin Marietta Corporation Chairman Norman Augustine stated that with "this particular consolidation we built a critical mass to compete in international markets. These are Darwinian times in our industry. The failure to change is the failure to survive." (Finnegan, 1994) Similar mergers have come in response to Lockheed Martin's to include the merger of Northrop Grumman and Vought Aircraft with more mergers of U.S. corporation expected.

The restructuring of U.S. defense corporations will likely be tied with an increased emphasis on transatlantic cooperation. It is unlikely that foreign purchase of U.S. corporations will rise significantly; however, international armaments collaboration in the areas of subcontracting, dual-use technologies, data transfer, basic research and offsets will be the tools of choice to achieve this cooperation.

There already exists a sizable international trade in defense applicable subsystems and most U.S. weapon systems actually contain considerable numbers of foreign components. Some subsystems are based on dual-use technologies or components such as computers, electronics and communications, and represent a hidden form of globalization. U.S. combat aircraft are equipped with British heads-up displays and ejections seats, while American precision-guided munitions often rely on Japanese-produced computer chips and ceramic packages.

This cooperation extends to personnel exchanges of engineers and scientists where transnational technology sharing is conducted. Sharing of basic and exploratory defense research and development is also on the rise. Collaborative activities such as Rockwell with

DASA, a German aerospace firm, on the X-31 experimental aircraft and McDonnell Douglas with British Aerospace on advanced vertical takeoff technology are indicators of the globalization trend. Additional international collaboration in the commercial marketplace, specifically aerospace and electronics, involving East Asia, Russia and Eastern Europe are also indicative of this trend when the prospects for potential spin-on military applications are considered.

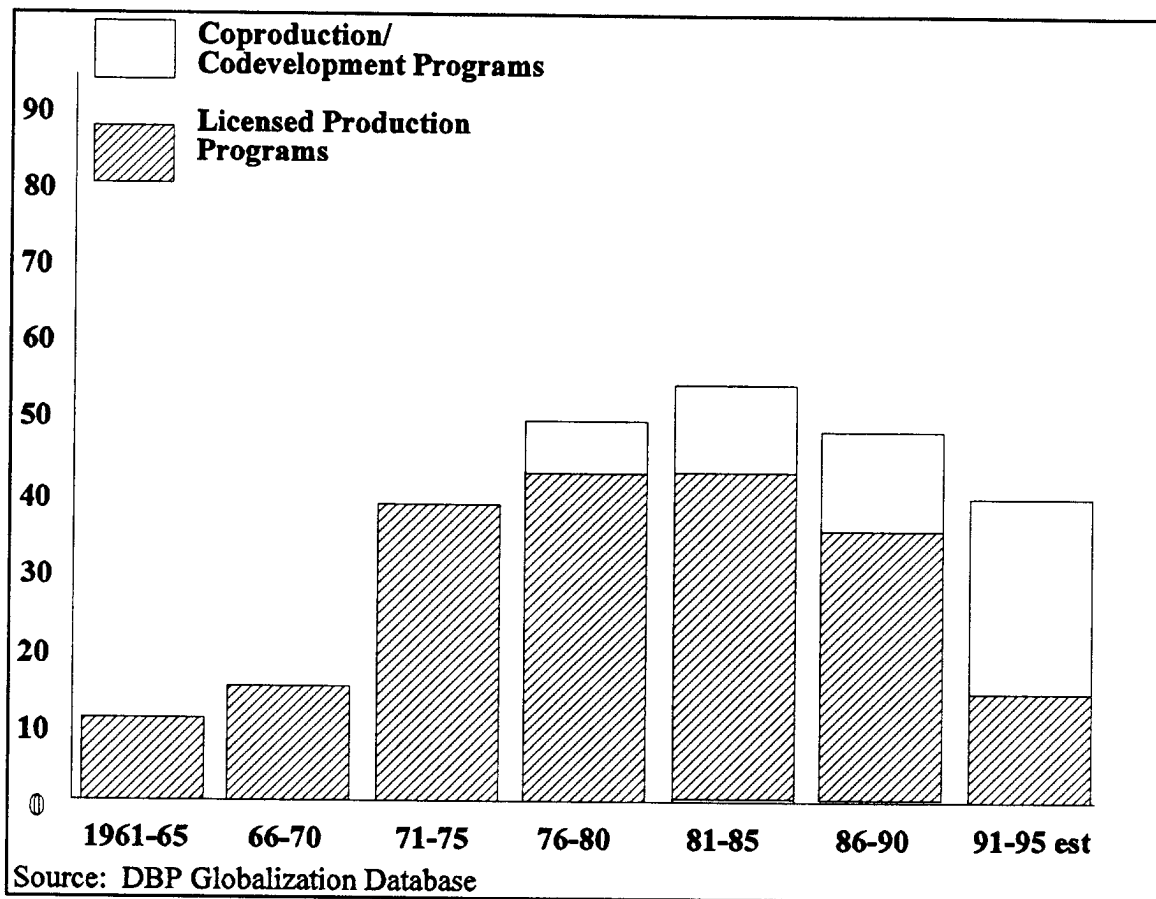
#### **D. CONSEQUENCES OF OFFSETS IN GLOBALIZATION**

The findings presented do not portend a specific trend but rather a more general one. Offset agreements of the past, particularly in the area of coproduction/development, subcontractor production and technology transfer have given rise to the number and capabilities of foreign competitors. These agreements have established more or less formal relationships between U.S. prime contractors with defense contractors abroad. With the drawdown of arms sales, and the increasingly protectionist philosophies of Western European governments, U.S. contractors, to maintain their economic viability and competitive positions, are finding it increasingly necessary to expand their transnational connections and engage in more cooperative programs in order to share risks, gain access to foreign technologies and markets (Bitzinger, 1994).

Similar trends that characterized the collaboration between the U.S. and Western Europe that gave rise to their defense industrial base appear to be occurring in the developing world. Third world countries have increasingly become partners in collaborative arms projects. Since the 1970s, when only a handful of third world countries possessed the capability to manufacture arms, more than 20 countries have developed that capability. While licensed production remains the major means of arms manufacture, as with NATO during its early years, codevelopment/production is on the rise in developing countries. Figure 2 illustrates the trend that has occurred from 1961 to the present.

As developing countries have developed their own capabilities, they have established considerable sophistication in certain arms niches, such as light combat aircraft, antishipping





**Figure 2 U.S. Arms Cooperation with Third World Countries 1961 - 1995**

missiles, defense electronics and systems upgrades. These newly industrialized countries are exporting this "know-how" abroad to other countries of the developing world to increase their market share. Israel, maker of the Gabriel antiship missile, has issued licenses to Taiwan for that purpose. Cooperation between China and South Africa, and Pakistan in the areas of missiles, aircraft and armored systems is a further indication that the development and transfer of weapons technology between developing countries is on the rise.

The increasing globalization of arms production has economic, as well as political and military consequences for both the U.S. Government and industry. Shrinking military procurements and the absence of an identifiable foe that would warrant increased spending, suggest that increased cooperation between foreign governments and firms is essential to the

preservation of our defense industrial base. By establishing international relationships within the arms industry, the U.S. may be able to cost-effectively maintain the necessary military R&D and production capability for our national defense. The U.S., due to the strength of its industrial base and its dominance in the aerospace industry, will not need to go to the extremes that other countries may. The U.S. will not, however, remain untouched. The effect will occur at the lower tier subcontractor level, where a foreign presence is significant or dominant. These areas are where past offset agreements have had their greatest effect and are likely to be more significant in the future.

The notion of maintaining an indigenous U.S. defense industry has gone the way of the horse and buggy. Regional alliances such as the Western European Union and its associated West European Armaments Group, founded on the basis to maintaining a viable independent defense industrial and technology base, will likely close their markets to countries or foreign defense firms who do not subscribe to this new level of cooperation. Similar to consequences contained in the newly adopted General Agreement on Trade and Tariffs (GATT), countries that do not abide by its content could be subject to penalties, such as trade embargoes.

U.S. participation in international collaborative arms programs must continue to emphasize the goals of strengthening its friends and allies and enhancing alliance coordination and effectiveness through RSI benefits. Additionally, the U.S. Government must continue to address globalization as a means to preserve and strengthen the U.S. defense industrial base, by gaining access to foreign markets and innovative technologies, particularly commercial technology with dual-use application. Americans would like to be self-sufficient in not only defense but all aspects of our economy, enjoying the benefits of higher employment and standard of living. But longing for what was or cannot be is counterproductive to making what is best for the U.S. in today's new world order.

## **E. SUMMARY**

Globalization has emerged to some extent due to U.S. benevolence to its allies and former enemies following the end of World War II when it rebuilt their economic and military capabilities. The emergence of the Soviet threat, and the subsequent NATO alliance, caused the U.S. and its allies to realize the importance of commonality of equipment and supplies in a European conflict. Motivated by rationalization, standardization and interoperability requirements, armaments cooperation within NATO increased, resulting in reduced R&D and production costs. As U.S. foreign policy extended beyond the borders of Europe to encompass Asia and the Middle East, similar cooperation has occurred.

The use of offset agreements, particularly in the area of codevelopment/production, subcontracting and technology transfer, was one of the mechanism to implement this cooperation. Overshadowed by national security and alliance concerns, U.S. economic factors in certain sectors of the economy felt the negative effects of the offsets. U.S. industries who were competitive and held a strong position on the world market benefitted from these agreements. The U.S. aerospace industry increased its trade balance from \$4.3 billion in 1973 to \$16 billion in 1987 (OMB, 1989). U.S. companies in the aircraft parts and equipment sector suffered a decrease in annual output due to these very same offset agreements, attributable to their non-competitive market position and the significance of foreign competition in that sector.

The increase in the number of countries capable of producing arms or components, coupled with an era of shrinking military budgets and an increasingly competitive defense market, it is apparent that transnational cooperation in arms development and production is necessary to maintain the core capabilities within the U.S. defense industrial base. To refuse to do so is to be alienated from cooperative arrangements involving foreign markets, resources and technologies.

The globalization trend is not without its negative consequences. The increase in the number of developing countries with arms production capabilities warrants attention, as do old Cold War policies and mindsets that must be adjusted to the current situation, with the necessary foresight to see the potential consequences to be discussed in the Chapter VI.

## **VI. CONCLUSIONS AND RECOMMENDATIONS**

Offset agreements as a condition of sale for military exports are not, from a macro perspective, harmful to the U.S. economy, but are a necessary evil for U.S. defense contractors to remain competitive in the world's arms market. With DoD and other nations' defense procurement budgets declining, the international arms market is characterized by increased competition. Included within this market are competing political objectives, designed to enhance the recipient country's economic well-being, that break from the traditional free market environment where sales are consummated based on the price and quality of the product being sold. Today's arms market is a buyer's market, requiring sellers to offer incentives to the buying country that appeal to their economic, political and national security objectives.

Congressional scrutiny of offsets during the mid to late 1980s stated that these concessions effectively exported defense jobs and revenue abroad at the expense of U.S. workers and corporations. This is partially true. U.S. defense contractors agree to license or subcontract with foreign firms to close their deals, hurting some U.S. companies. The negative effects of these agreements are offset by the influx of work created in the U.S. by the sale itself. The significance that offset agreements have in international arms sales also lends credibility to the notion that without the offset agreement, the sale would not have been made. The sale of the Boeing AWACS aircraft to Britain illustrates the importance that offset agreements have in completing a transaction. Boeing's agreement to subcontract the production of some components and subassemblies in Britain appealed to the British Government's objective of enhancing their aerospace and defense industry, making the sale less onerous. More importantly, however, it brought \$1.13 billion of revenue to the U.S., along with continued employment for other U.S. defense corporations (OMB, 1990).

From a national security perspective, the sale of the AWACS aircraft provided the U.K. and the NATO alliance with a sophisticated tactical air threat detection, surveillance and early warning capability previously filled by their aging fleet of Shackleton aircraft, which had

been in service for 40 years. The adoption of the AWACS by the Royal Air Force appealed to NATO rationalization, standardization and interoperability (RSI) desires since the AWACS is also used by a number of other NATO countries to include the U.S., France and Germany.

The issue of offset agreements is also misplaced because it is symptomatic of a much larger challenge, namely, globalization of the arms industry. Offsets are one of the mechanisms by which globalization has occurred from its inception between the U.S. and its NATO partners to its current practice between the industrialized and developing world. Originally designed to lift allies and former foes from the destruction of World War II, the U.S. transferred technology and know-how to our European allies in an effort to rebuild their economic, industrial and military capabilities. Similar actions have occurred between the U.S. and other countries in the Middle East, Asia and Latin America as U.S. resolve to contain communism encouraged U.S. investment in the free world in the place of U.S. troops and presence.

This chapter will evaluate the effects offset agreements have had in the areas of defense preparedness, industrial competitiveness and U.S. national security. The conclusions are drawn not only from the empirical data provided in the coordinating committee's 1990 report to Congress, but also from information regarding the globalization trend. The chapter will conclude with recommendations on how the U.S. can counter the potentially negative aspects of globalization, while maintaining the critical core capabilities in the defense industrial base.

## **A. DEFENSE PREPAREDNESS**

A measure of how offsets have affected the U.S. in the area of defense preparedness is its contribution to U.S. national security issues. Offsets have been a critical facet in making some sales of U.S. equipment possible to NATO and other allied and friendly countries. Offsets' contribution to the NATO objective of RSI has enhanced the defense readiness and sustainability of this alliance. These agreements support the U.S. coalition defense strategy, which includes not only the U.S. industrial base, but the industrial preparedness of our overseas defense partners and their ability in certain contingencies to produce U.S. systems

overseas. The threat of interdiction in the North Atlantic sea lanes of replenishment and replacement material from the U.S. makes the capability to second source critical material from producers on the European continent even more critical to the success of NATO military action.

Another relevant measure of the impact of offsets on defense preparedness is the extent to which defense exports and their associated offsets have net economic benefits or costs to the sectors of the economy supporting national defense. Conclusions drawn from the data compiled from the coordinating committee's 1987 survey indicates that for the period of 1980 - 1987 the effects of offsets play only a minor role in terms of the overall output of defense and non-defense industries. Only five defense related sectors experienced greater than a one percent change in net average annual output as a result of the direct effects of sales and offsets. Four of the five sectors experienced positive effects and include ordnance and accessories, aircraft, aircraft engines and engine parts and engineering and scientific instruments. The only sector to experience negative effects was the aircraft parts, component and accessories industry. As a whole the U.S. sold almost \$35 billion of arms to foreign countries while incurring \$20 billion in offset obligations (OMB, 1990).

A major issue in the analysis of offset agreements is the impact they have on subcontractors. The large U.S. defense companies that negotiate offset agreements do not enter into agreements that adversely affect them. The concessions made are normally felt by lower tier producers within the subcontractor base. It is evident from the survey results that offset obligations in the form of subcontractor production is the most popular form of offset, accounting for over 36 percent of the offset obligations incurred. (OMB, 1990)

The significance is not only the displacement of work for U.S. subcontractors, but more importantly, the increased level of foreign sourcing of weapon system components and subassemblies. Foreign sourcing as a result of offset agreements does provide some benefit to the U.S. RSI and foreign policy goals are achieved, and while foreign sourcing does carry some negative consequences, these negative effects should be contrasted with the belief that without such agreements, the sale may not have been made. As the globalization trend

continues, however, the end does not always justify the means, and the level of foreign sourcing in U.S. weapon systems remains an issue that warrants further attention.

As coproduction/development and subcontractor production increasingly become the preferred method of cooperation between defense industries, the level of foreign sourcing is likely to increase. Foreign defense industries will attempt to reinforce or expand their market position at the expense of U.S. competitors. Manufacture of components and subassemblies will occur offshore, displacing U.S. near term capacity to produce these items. (OMB, 1990) DoD surge requirements to support regional conflicts or general war may not be satisfied due to an extended logistics tail between U.S. forces and foreign factories. Political or ideological differences may hamper the necessary cooperation to support the U.S. requirement. The U.S. has withheld military arms or assistance to encourage other nations to adopt a particular stance or take a certain action that is consistent with U.S. foreign policy. As foreign sourcing replaces domestic capability and foreign dependence occurs, the U.S. could find itself in a similar situation but on the other end of the stick.

It is not at all clear where foreign sourcing becomes a threat to our national security. Of the offset agreements for subcontractor production, 92 percent were with allies and friendly nations (OMB, 1988). As time goes on, governments change and the strength of these relationships will ebb and flow, increasing the level of uncertainty associated with the threat of foreign sourcing. The extent to which U.S. manufactured weapon systems are supported by foreign sourced components is also unknown, much to the chagrin of the Joint Logistics Commanders whose concern is for the logistics support of U.S. forces in a protracted conflict (Zycher, Solomon and Yager, 1991). The intent is not to be reactionary and label foreign sourcing as unequivocally bad. To the contrary, foreign sourcing is necessary given the increased level of cooperation required of globalization. The old farmer's axiom of not putting all your eggs in one basket, however, should also be heeded.

## **B. INDUSTRIAL COMPETITIVENESS**

The effects offset agreements have had in the area of industrial competitiveness are similar to those in defense preparedness. The measure of success U.S. defense industries have had in light of offsets has been favorable. The positive defense trade balance between the U.S. and its trading partners is indicative of the benefits flowing into the U.S. as a result of military exports influenced by offset agreements.

Although the survey data and current information indicate that the U.S. remains the world leader in arms production, the advantage has narrowed in recent years. In some areas, foreign technical capabilities are now comparable, if not superior, to those of the U.S.. Foreign firms have increased the speed with which they adopt and commercialize technology developed in the U.S. and have also improved their ability to develop technology on their own. (Inman and Burton, 1992)

Offset agreements have played a role in transferring technology and know-how to foreign companies who now compete successfully with U.S. firms for some defense contracts. As illustrated by the Boeing sale of AWACS to Britain, it was beneficial to contribute to the capabilities of British aerospace and electronic firms. The subsequent teaming of Westinghouse and the British firm Plessey in advanced research in phased array, fiber optics and electronic warfare technologies will increase the level of competition in that sector. This additional competition could lead to increased quality and reduced prices; however, with the reduction in demand for military hardware, U.S. corporations who either cannot compete or diversify into other areas will inevitably fail. (Bitzinger, 1994)

The failure of U.S. corporations is not entirely attributable to offset agreement. As Martin Marietta CEO Norman Augustine stated "these are truly Darwinian times." The drawdown in defense procurements, coupled with the need for increased cooperation across national lines, will weed out inefficient and non-competitive firms. Mergers and joint acquisitions are occurring as defense companies restructure to compete in the post-Cold War environment. The future will likely see mega-defense corporations emerging from the herd, specializing in niche arms markets, reducing the number of subcontractors they work with, producing more items internally and maintaining strong qualitative ties with other foreign



defense contractors. Lockheed Martin and McDonnell Douglas will continue to be the dominant forces in the Aerospace industry, maintaining relationships with British Aerospace and Matra of France to support their export business. Such relationships will be necessary to maintain access to foreign markets and technologies.

In addition to reorganizing and changing the face of U.S. defense firms, the U.S. defense industry will guard against giving the technology farm away by having something better in development. Therein lies an answer to remaining competitive in the international arms market in the long term. The future viability and competitiveness of the U.S. defense industrial base will be predicated on being able to remain the world leader in military research and development, to include both military specific R&D, and spin-on capabilities derived from commercial R&D with military application. (DDR&E, 1994)

U.S. research and development must not only look to the near term to develop the next generation of weapons systems to defeat the threat of the future, but it must also be tied with the U.S. defense industry in a cooperative program designed to support the defense sectors where U.S. dominance is desired. (Inman and Brooks, 1992)

Reductions in DoD R&D spending and its impact on the private sector means that it is unlikely that government or private funds will be available to cover the breadth of technology areas. Winners must be chosen and supported. The international diversification of the arms industry includes the research and development effort as well. U.S. efforts must be focused in the critical areas commensurate with our defense industry strengths.

As weapon systems become increasingly more sophisticated, the capability of the subsystems have also become more critical. For example, building the next generation fighter aircraft involves the technological advances in navigation, fire control, composite materials and many other areas. Improvements in manufacturing technology will reduce cost and increase performance through the use of robotics and micro-circuit design. The number of areas is endless. Rather than devoting scarce military R&D funding to all the areas, DoD and the defense industry should turn to the commercial sector for potential spin-on technologies but maintain an emphasis in defense R&D work.

Much of the technology used in military systems is obsolete compared to that available in the commercial sector. Modern computer systems used in artillery and combat aircraft fire control systems use microprocessors that have been labeled by the commercial marketplace as being obsolete and discarded. Fly-by-light capability could be integral in developing future combat aircraft, a technology spun-on from commercial fiber optics research and development. The "not developed here" mentality of the military and defense R&D labs must go, replaced by an openness to commercial developments and an effort to adapt their use to military applications. A balance must be developed that maintains a heavy defense emphasis but capitalizes on commercial efforts in areas where that marketplace is the leader. (Allison and Treverton, 1992)

### **C. NATIONAL SECURITY**

The effects of offset agreements in diffusing the centers of arms production to other industrialized and developing countries may present the greatest challenge to the long-term security policies and military capabilities of the United States.

Arms sales have generally been the focus of the spread of conventional arms throughout the world. However, the increasingly internationalized defense industry, an atmosphere contributed to by offset agreements, has provided arms production capabilities to more countries than previously encountered. Arms production capabilities, unlike arms sales, cannot be cut off once provided.

The U.S. has traditionally provided arms to allied and friendly countries as a means to establish a stabilizing factor in regional hot spots. As technology transfers and licensed production offset agreements are made, these countries are not longer dependent on U.S. support. Indigenous production capabilities could lead to regional arms races between traditional adversaries. The spread of arms production does not necessarily threaten the U.S. directly, but rather could lead to regional unrest in areas where U.S. interests reside. (Bitzinger, 1994)

The development of indigenous arms production capability in the Third World could also find some of these countries exporting arms to other developing nations. Brazil and

Israel, whose arms transfer policies have been labeled as "no questions asked," could flood certain sectors with their weapon systems (Bitzinger, 1994). Specializing in the low-to-mid tech weapons market, Third World arms producers could upset regional arms balances and accelerate local arms races. Arms transfers from this sector have been generally overshadowed by the types of weapons being transferred and their low technology characteristics. However, although the sophistication of their weapon systems may be obsolete by U.S. standards, they are just as deadly when engaging the less sophisticated forces in that region.

The increase in arms producers may reduce the influence the U.S. may exert by threatening to withhold arms deliveries. For example, the U.S. decision in 1974 to stop delivery of F-4 Phantom fighters to Saudi Arabia compelled the Saudis to purchase British Tornado fighters instead. The number of arms producers today represents alternative sources for countries to turn to if U.S. or other Western governments attempt to strongarm their actions. (OMB, 1988)

The contribution to conventional arms proliferation and technology transfer by offset agreements may also change the nature of the proliferation problem. As developing countries refine their arms technology, the U.S. may find itself threatened by their advanced weapon systems. Advances in tactical missile and long-range artillery systems could place U.S. forces within their destructive range. The need to combat this new military threat may require increases in military spending for force structure and R&D to maintain American military and technological advantage. (Bitzinger, 1994)

Lastly, some types of international arms cooperation, such as tactical missile and aircraft development, could lead to development of weapons of mass destruction. The concern with control of weapons grade plutonium within the former Soviet Union, along with arms cooperation, could reduce both the time and expense for those states contemplating a nuclear or chemical warfare capability. (OTA, 1994)

The Scud missile used during the Gulf War is a very simple and unsophisticated weapon system. Armed with a conventional warhead, it is more of a terrorist weapon than

of operational or tactical significance due to its inaccuracy. Armed with a nuclear or chemical warhead, however, its significance grows.

## **D. RECOMMENDATIONS**

### **1. Overview of Current Initiatives**

The future of U.S. defense preparedness and industrial competitiveness lies in our ability to plan for that future. Current U.S. produced weapon systems constitute leading edge technology compared to other foreign arms. However, as the U.S. transfers this technology abroad, the U.S. must ensure it has something even better in near-term development. The President and Congress have recognized that the U.S. lead in technological innovation and development is eroding and made technology and competitiveness a national priority.

The Clinton Administration has developed strategic investment priorities for their science and technology (S&T) programs. Their strategy focuses on two generic priorities, dual use technology and affordability.

The U.S. priority in dual use technology is a reflection of the fact that U.S. defense industries and associated public and private defense R&D centers cannot be sustained by current and future defense budgets. The U.S. recognizes that the defense industry and labs are no longer the sole source of defense related technologies. Much of the technology critical to national security is currently being developed and matured commercially and internationally. In the future, the U.S. must rely on the same industrial base that builds commercial products for its future military technological innovation and weapon systems. It is an objective of DoD science and technology policy to use the same technology and industrial base, where feasible, to build military products and commercial products (DDR&E, 1994).

DoD's tactics for achieving their strategic objective include the integration of the military and commercial industry to achieve a more cost-effective, single set of industrial enterprises that are capable of developing and building more affordable and productive military and commercial products (DDR&E, 1994). The defense S&T priorities foster this

intergration by preferentially developing technologies that have dual use.

Each Service has been tasked to develop formal, targeted, dual use programs to develop technologies critical to their needs. These formal programs will provide the basis for sustained investment into priority technologies, particularly those that are in their infancy. DoD's commitment to make early, long-term investments into emerging technologies can ease these technologies from their birth through their development until they have matured into a stable industry.

In addition to fostering emerging technologies, DoD is exploiting commercial technologies. Commercial technology and products, such as electronics, software and communications represent the latest technology available to DoD. By adopting such products for defense purposes, DoD can shorten the development time for next generation weapon systems and divert scarce DoD R&D funds to areas where a commercial technology or product cannot satisfy the requirement. (DDR&E, 1994)

As a catalyst to adopt commercial products and provide information on defense dual use developments, DoD has endeavored to strengthen its technology transfer efforts. Each Service is expected to establish a program that facilitates the transfer of technology to other DoD and Service laboratories, industry, universities and not-for-profit laboratories. Increased participation in regional, state and local alliances is encouraged to aid not only in fostering technology transfer, but to monitor what is available in the commercial market, as well as other defense-related facilities.

DoD has developed an aggressive strategic investment program centered around the respective Services' efforts in defining and implementing their own S&T programs. Their efforts will satisfy the next generation weapon systems and will likely be focused in the applied research arena. However, without a similar investment in generic or basic technologies, such efforts will only satisfy near-term not our long-term objectives.

## **2. Military and Commercial Research and Development**

In order to address the generic technology area, the President should establish a forum to work with industry to identify and set priorities in critical generic technologies, along with a plan to implement their development. Agencies such as ARPA, the National Institute of Science and Technology (NIST) and the National Science Foundation (NSF) should be part of this forum, working with industry to advance U.S. leadership in these critical generic areas. (Inman and Burton, 1992)

DoD's efforts should also encompass what is available or being developed outside our borders. Monitoring of commercial and defense technologies should include those being developed by foreign countries for possible application to U.S. defense needs. This effort not only allows the U.S. to exploit foreign technologies, but serves as an early warning intelligence capability. (OTA, 1994)

U.S. industry must also establish goals to surpass existing capabilities in commercializing technologies. Innovative breakthroughs must be taken from the drawing board to production line. Building on successful domestic and foreign practices, U.S. industry should establish goals and allocate their resources to support their program. (Inman and Burton, 1992)

Basic research conducted at universities should also have closer ties to industry and focus their effort more effectively in areas where there are real technology needs.

## **3. Foreign Sourcing**

The Department of Defense should continue to assess its current dependency on foreign sources for critical components in weapon systems and monitor future systems. DoD should develop a measure of when this foreign sourcing becomes a threat to our national security. In areas determined to be a threat, DoD should take steps to second source these components from other domestic or foreign companies. DoD acquisition strategies should include the capability to second source critical components through the purchase of technical data rights or cultivate a second source during system development/production.

If second sourcing is not cost-effective or possible, other diplomatic or alternative means should be implemented to mitigate dependency by fostering relationships with the

foreign government or firm.

#### **4. Defense Industrial Base**

The U.S. Government should enhance the competitiveness of U.S. industry abroad by facilitating their market position in the international marketplace. Review of the cold war trade policies and export restrictions should progress beyond its current state of being mired in bureaucratic discussion. U.S. trade policies and export restrictions should endeavor to foster U.S. industry's ability to cooperate. U.S. technology transfer and security policies must shift from their protectionist bias, to one that supports industry-to-industry cooperation. This policy must have a delicate balance, supporting not only this cooperation, but also guarding U.S. critical military technologies and addressing other foreign policy issues such as arms proliferation. Such technology and foreign policy goals should be identified and supported. (OTA, 1994)

The restricted technology transfer and export control lists should not be static, but evolutionary supported by innovative technological investment that allows non-nuclear technology and material to be transferred when replaced by something even better. With the emphasis on dual-use technology, excessive control of its military application will largely be undermined by its inevitable transfer in the commercial market. (Johnson, 1990)

U.S. export controls for items that are available from other countries in similar quality and quantity should also be removed. Such actions would level the playing field between U.S. defense firms and foreign firms that operate under less stringent export controls. (OTA, 1994)

Government acquisition and regulatory policies should be revised to boost U.S. industry performance and competitiveness. NIST and industry should develop dual military-industrial standards to reduce the barrier between defense industries competing effectively in the commercial marketplace. This effort will aid defense companies, whose strategy calls for diversification into non-defense industries as a result of the decline in demand for arms, to transition smoothly into this new endeavor. (Inman and Burton, 1992)

The U.S. Government must recognize that its defense industrial base will contract from its previous size. Efforts to preserve inefficient, non-competitive firms should be

redirected to supporting defense firms that are indicative of U.S. critical capabilities and goals.

## **5. Globalization**

The challenge to the U.S. presented by globalization is to determine how best to support globalization's positive economic features while ensuring that this process does not adversely affect U.S. security and foreign policy interests. In concert with other industrialized nations, the U.S. must carefully balance its defense industrial base needs against its national security concerns. A distinction must be made between bad globalization and good. (Bitzinger, 1994)

A collective body of industrialized nations may adopt a two-tiered approach, one that distinguishes between arms collaboration within their collective body and armaments cooperation involving the developing world, where the risks of proliferation and of heightening regional tensions are higher.

The U.S. needs to better integrate and coordinate the oversight and regulatory functions of its various governmental departments and agencies. A lead agency should be given responsibility for the review of all defense-related globalization initiatives, to include transnational industry collaboration. Most importantly, though, is the development of a coherent and unified set of policies to provide the basis for government oversight regarding globalization. (Bitzinger, 1994)

## **6. Export Controls and Proliferation**

The quandry that the U.S. finds itself in is the growing need for increased collaboration with foreign countries to preserve a viable defense industrial base, all the while maintaining sufficient controls to ensure that the threat of proliferation of weapons of mass destruction and missiles that deliver them does not escalate out of control. Export hawks and non-proliferation doves are in a tug-of-war to determine the appropriate balance between export promotion and export control. While proliferation is at the top of the foreign policy agenda, economic imperatives seemingly have tipped the balance away from national security considerations toward a more liberal export policy (Schneider, 1994).

The Clinton administration has attempted to streamline the implementation of U.S.



non-proliferation export controls by balancing the need for more exports with requirement to prevent exports that would make a material contribution to the proliferation of weapons of mass destruction (White House, 1993). In line with this streamlining policy, President Clinton has also eased U.S. export controls on computers and telecommunications technologies, allowing more high-speed computers to be sold abroad (Wolfsthal, 1993).

The Administration's efforts are an attempt to influence the supply-side non-proliferation activities by making it more difficult for countries aspiring to nuclear capability to obtain the sensitive technologies, material and know-how to develop such weapons. In addition to the current technology available, the U.S. must not lose sight of older technology, which is perhaps more useful to nuclear aspiring countries. Nuclear weapons produced by technology from the Manhattan Project are just as deadly as those produced by more modern means. Third World countries can more readily absorb the older technology and processes in developing their nuclear capability than the newer ones due to the additional infrastructure and costs associated with the latest methods (Sands, 1994).

The denial of nuclear weapons related technology and material, in and of itself, is not the answer to the non-proliferation question. Similar controls have been in effect since 1945 but have not prevented proliferation to other industrialized and developing nations. Supply-side proliferations efforts should continue to be combined with diplomatic initiatives, security guarantees and regional arms control (Sands, 1994).

The U.S., along with other industrialized countries, must use its influence with the Third World to combat the emergence of the arms industries in the developing world. Use of foreign assistance or the withholding of that assistance could be a valuable tool of encouragement. (Bitzinger, 1994)

The industrialized nations, to include Russia and the former Warsaw Pact countries, should continue to pursue the objective of establishing a new international control regime, similar to the Coordinating Committee for Multilateral Export Controls.<sup>13</sup> Its charter should

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<sup>13</sup>This COCOM was established during the Cold War to restrict Western high-tech exports to communist bloc and other threatening countries. It was disestablished in early 1994.

include the control of technologies to the developing world that have direct or indirect application to armaments production, particularly weapons of mass destruction. While current attempts to develop a new international control regime are mired in the fear of exposing national industries to global competition, such fear must be displaced by the greater concern of controlling arms proliferation. (Hitchens and Opall, 1994)

U.S. export controls can be enhanced by developing a shared and improved database of export items, buyers and end-users that pose a proliferation risk. The Departments of Energy, Commerce, State and Defense and other agencies can collectively use the information to distribute and analyze information on the proliferation problem. The intelligence agencies can provide valuable information in assessing a buyer's nuclear program and the threat of a third party transfer to a state that would not normally receive U.S. approval to acquire nuclear related material or technology. (OTA, 1994)

In addition to internal export controls and the establishment of a new international control regime, improvements in coordination between other nuclear supplier countries should be made. The U.S. pilot program for a shared computer network among the Nuclear Suppliers' Group<sup>14</sup> (NSG) is an example of the communications and information tools necessary to achieve this cooperation. Such a network would increase coordination between the nuclear suppliers. Information pertaining to the denial of a nuclear related export license by one member country would be available to other countries. Once refused an export license in one country, a potential buyer would not be able to receive an export license from another member country (OTA, 1994). Similar networks could be established in other export control regimes such as the Australia Group (chemical and biological weapons) and the Missile Technology Control Regime (MTCR) to provide similar advantages.

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<sup>14</sup> The NSG is a group of nations that have agreed to common export control policies for nuclear technologies and dual-use technologies applicable to nuclear programs.

U.S. export controls, combined with multilateral control arrangements, whether they be information sharing networks or expanded intelligence sharing, will aid the nuclear supplier countries in making informed decisions regarding the export of nuclear related technology and material.

#### **E. FUTURE RESEARCH AREAS**

This research evaluated the effects of offset agreements and the part they have played in the globalization of the arms industry. Further research in the area of globalization, to include U.S. industry reaction, the nature of transnational defense industry collaboration and the degree of success of that collaboration is appropriate.

Furthermore, this research also highlighted the implications of globalization in the context of foreign sourcing and dependency. An evaluation of the level of foreign sourcing of U.S. weapon systems, with an analysis of its implications on U.S. national security and how it affects military contingency planning and doctrine would provide valuable insight into the challenges the U.S. faces in this new era of international cooperation.

The importance of funding future U.S. research and development efforts and their significance in strengthening the U.S. defense industrial base was discussed. With the current push to get government spending and the deficit under control, funding for R&D both in DoD facilities and for cooperative programs with industry will be limited. Research into the best allocation of these limited Federal funds would be beneficial.

Lastly, an evaluation of the developing countries' armaments production capabilities in light of U.S. regional interests needs further attention. How should the U.S. respond from a foreign policy perspective to this challenge, considering its implications for arms proliferation and possible heightening of regional unrest?

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